

South Carolina Regional Transmission Planning

Stakeholder Meeting

Hilton Garden Inn

North Charleston, SC

April 15, 2013

Purpose and Goals of Today's Meeting

- FERC Order 1000 Interregional Requirements
- Review Current Transmission Expansion Plans
- Review Key Data and Assumptions for Next Planning Cycle
- Review Economic Power Transfer Sensitivities – Initial Findings
- Review Status of Assessment and Planning Studies
 - CTCA
 - ERAG
 - SERC
 - Other

FERC Order 1000 Transmission Planning and Cost Allocation

Interregional Requirements

Clay Young

Order 1000 – Regional Requirements Update

- Order 1000 Rule issued October 11, 2011
- Regional and Interregional Requirements
- SCE&G filed Regional compliance filing on October 11, 2012
- SCE&G Filing is on the FERC agenda for Thursday (April 18)
- Effective Date of Regional requirements will be set based on the FERC ruling

Order 1000 – Interregional Requirements

- Interregional compliance filing originally due April 11, 2013
- FERC granted an extension until July 10, 2013
- April 1 – Emailed a DRAFT Strawman
- April 15 – Discuss with Stakeholder Group
- Effective Date of Interregional requirements will be after the FERC ruling on the compliance filing

FERC Order 1000 – Interregional Requirements

- Interregional Coordination
 - Coordination
 - Data Exchange
 - Joint Evaluation
 - Transparency
- Interregional Cost Allocation
 - Must satisfy the six interregional cost allocation principles

FERC Order 1000 – Interregional Requirements

- Coordination

Requirement:

Develop and implement procedures that provide for the sharing of information regarding the respective needs of neighboring transmission planning regions.

FERC Order 1000 – Interregional Requirements

- Coordination
 - During each regional planning cycle, the SCRTP transmission planners and those in adjacent regions will:
 - Engage in Data Exchange/Joint Evaluation AND
 - Review each other's current regional plan(s)
 - Typically occurs in the January to June timeframe
 - Regional plans contain respective region's transmission needs

FERC Order 1000 – Interregional Requirements

- Coordination
 - Neighboring regions will also coordinate in regards to the evaluation of interregional facilities proposed for cost allocation purposes (“CAP”).
 - Typically begin in the mid-year timeframe
 - Status updates will typically occur every six months and will include
 - An update of the region’s evaluation of the proposal
 - The latest calculation of regional benefits (if available)
 - Anticipated timeline of future assessments/reevaluations of the proposal

FERC Order 1000 – Interregional Requirements

- Data Exchange

Requirement:

Through clearly described procedures, exchange planning data and information between neighboring planning regions at least annually.

FERC Order 1000 – Interregional Requirements

- Data Exchange
 - At least annually, load-flow models for the current regional plan(s) of the SCRTP and adjacent regions will be exchanged between transmission planners:
 - Typically at the beginning of each region's planning cycle
 - Only data/models related to the current regional plan(s) and used in the respective regional processes will be exchanged
 - Data will be posted on the pertinent regional planning process' website and neighboring regions will be notified via email
 - Data is considered CEII (available to interested parties subject to appropriate clearances/agreements)

FERC Order 1000 – Interregional Requirements

- Data Exchange
 - SCRTP regional plans will be posted on the SCRTP website
 - Typically around the 4th quarter SCRTP meeting
 - Regional plans will also be emailed to neighboring regions
 - Neighboring regions will exchange their current regional plan(s) in a similar manner according to their respective timeline

FERC Order 1000 – Interregional Requirements

- Joint Evaluation

Requirement:

Develop and implement procedures for neighboring planning regions to identify and jointly evaluate transmission facilities that are proposed to be located in both regions that may more efficiently or cost effectively address the individual needs identified in their respective local and regional processes.

FERC Order 1000 – Interregional Requirements

- Joint Evaluation
 - The SCRTP and neighboring regions will exchange data and current regional plan(s) as previously described.
 - The SCRTP and neighboring regions will review one another's plans, which includes solutions to address current regional needs.
 - If through this review, a potential interregional facility that may be more efficient and cost effective is identified, the transmission planners in neighboring regions will perform the required analysis/evaluation of the facility on their respective systems.

FERC Order 1000 – Interregional Requirements

- Joint Evaluation
 - The SCRTP and the neighboring region will act through their respective regional processes to perform analysis
 - Analysis performed will be consistent with planning practices used in the respective regions to develop regional plan(s)
 - To the extent possible/necessary, assumptions (i.e. years of study) and models will be coordinated among the regions.
 - If an interregional facility is proposed in the SCRTP and a neighboring region for CAP, the initial evaluation will typically begin in the mid-year time frame

FERC Order 1000 – Interregional Requirements

- Transparency

Requirement:

Make transparent the analyses undertaken and determinations reached by neighboring transmission planning regions in the identification and evaluation of interregional transmission facilities.

FERC Order 1000 – Interregional Requirements

- Transparency
 - Procedures for coordination and joint evaluation will be posted on the SCRTP website
 - Access to the data utilized will be made available subject to appropriate clearances/agreements
 - At the SCRTP 4th quarter meeting (or as necessary due to current activity of proposed interregional facilities), the SCRTP will provide status updates of interregional activities including:
 - Facilities to be evaluated
 - Analysis performed
 - Determinations/results

FERC Order 1000 – Interregional Requirements

- Cost Allocation

Requirement:

Develop a method or set of methods for allocating the costs of new interregional transmission facilities proposed for cost allocation that two neighboring transmission planning regions determine resolve the individual needs of each region more efficiently and cost effectively and that meets all six interregional cost allocation principles.

FERC Order 1000 – Interregional Requirements

- FERC Order No. 1000
 - Six Interregional Cost Allocation Principles
 - 1) The cost of transmission facilities allocated to each region in a way that is roughly commensurate with benefits.
 - 2) No involuntary allocation of costs to a region that receives no benefits.
 - 3) Benefit to Cost threshold, if used to determine if facilities have sufficient net benefits to be selected for interregional cost allocation, cannot exceed 1.25.
 - 4) The cost allocation method cannot allocate costs to regions where the facility is not located, unless that region voluntarily agrees to assume cost.
 - 5) The cost allocation method and data requirements for determining benefits and identifying beneficiaries must be transparent.
 - 6) Neighboring regions may have different cost allocation methods for different types of facilities. Each cost allocation method must be clearly set out and explained.

FERC Order 1000 – Interregional Requirements

- Cost Allocation
 - Interregional Proposal Criteria
 - Transmission project must be interregional in nature
 - Located in, and interconnected to, the SCRTP and an adjacent/contiguous planning region AND;
 - Operate at a voltage of 230 kV or greater and span 50 miles or more.
 - Transmission project must be proposed for CAP in each region that is in the path of the proposed facility or is an identified beneficiary
 - Submittal by the dates/timeframes defined in regional processes
 - The transmission developer and project submittal must satisfy all criteria in the respective regional processes

FERC Order 1000 – Interregional Requirements

- Cost Allocation
 - Interregional Proposal Evaluation - Benefits
 - Each region, acting through its respective regional planning process, will evaluate submittals to determine whether the proposal addresses transmission needs that are currently being addressed with projects in the regional planning processes
 - If so, which local/regional projects could be displaced and/or deferred by the proposal?
 - Each region will quantify a benefit based upon the transmission costs that each region is projected to avoid if its transmission projects were displaced by the proposal

FERC Order 1000 – Interregional Requirements

- Cost Allocation
 - Interregional Proposal Evaluation – Regional BTC
 - Each region will calculate a regional benefit to cost (BTC) ratio consistent with its process and compare to its regional threshold to determine if facility appears to be more efficient and cost effective
 - The anticipated percentage allocation of cost of an interregional facility proposed for CAP to be allocated to a region (to be utilized in the region's BTC calculation) will be:
 - Based upon the latest benefit calculation of the region(s) shown to be beneficiaries
 - Each region will continue to follow respective regional processes that outline BTC calculations/reevaluations

FERC Order 1000 – Interregional Requirements

- Cost Allocation
 - Inclusion in the Regional Plans
 - An interregional facility proposed for CAP will be included in the respective regional plans only when:
 - Each region has performed all evaluations, as prescribed in regional process, necessary for a facility to be included in the regional plan for CAP, **and**
 - Each region has obtained all approvals, as prescribed in regional process, necessary for a facility to be included in the regional plan for CAP

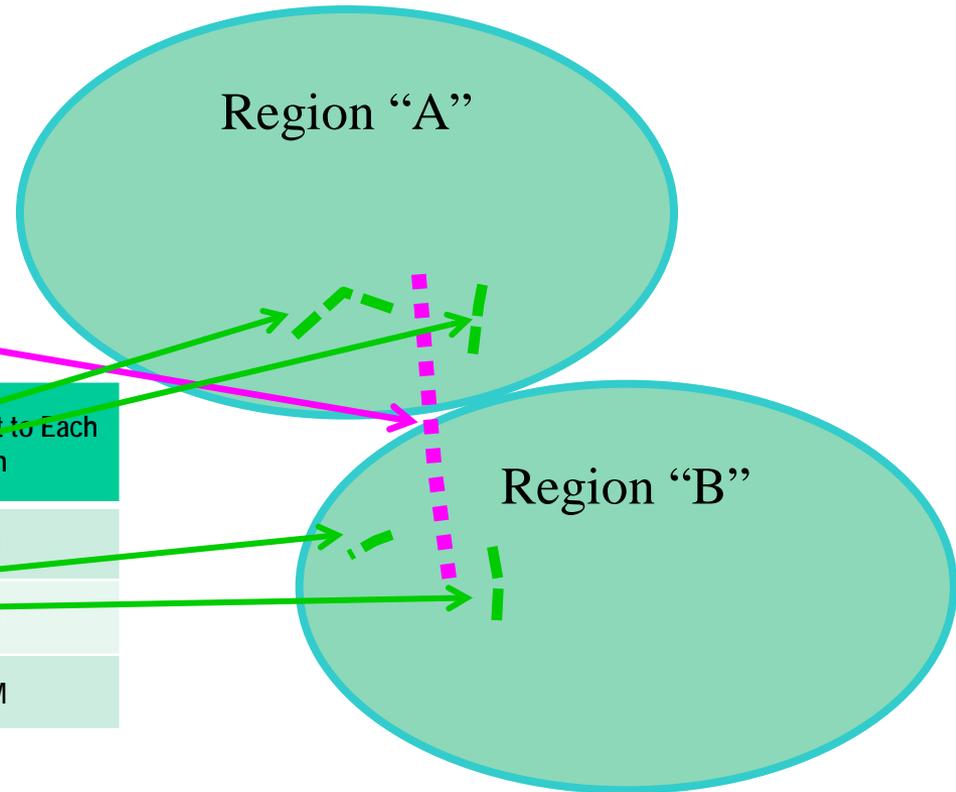
FERC Order 1000 – Interregional Requirements

- Cost Allocation
 - Cost Allocation Method
 - The cost of an interregional facility, selected for CAP in neighboring regions' plans, will be allocated to each region as follows:
 - Each region allocated the cost of the interregional facility in proportion to its total costs of transmission projects that will be displaced by the proposal
 - Allocation would be based upon the latest benefit calculation performed (immediately before each region included facility in its regional plan) and as approved by each region.
 - » The respective regional benefit calculations for purposes of interregional cost allocation will be based upon the capital cost of displaced projects
 - Costs allocated to each region would be further allocated within each region pursuant to its regional cost allocation methodology

Cost Allocation Example

Interregional Project Cost
 \$100 M

Region	Displaced Transmission Cost	Interregional Cost Allocation %	Allocated Cost to Each Region
"A"	\$90 M	60%	\$60 M
"B"	\$60 M	40%	\$40 M
Total	\$150 M	100%	\$100 M



Region	Regional BTC Calculation	Regional BTC Ratio
"A"	\$90M / \$60M	1.5
"B"	\$60M / \$40M	1.5

 Proposed Interregional Facility
 Displaced Transmission Facility

FERC Order 1000 – Interregional Requirements

- Cost Allocation
 - Reevaluation/Removal from Regional Plans
 - An interregional facility may be removed from a regional plan for CAP based upon failure to meet developmental milestones and/or reevaluation procedures specified in the respective regional processes
 - Removal can also occur if the interregional project is removed from the neighboring region's plan(s)

Order 1000 – Interregional Requirements

Next Steps

- April 24th: Stakeholders submit comments on strawman
- Mid May: Provide draft tariff language
- Late May: Host interim stakeholder meeting, if needed
- Early June: Stakeholders submit comments on draft tariff language
- July 10th: Interregional compliance filing due

FERC Order 1000 – Interregional Requirements

Stakeholder Input, Comments and Questions

Current Transmission Expansion Plans

SCE&G and Santee Cooper

Current Transmission Expansion Plans

SCE&G

Kale Ford

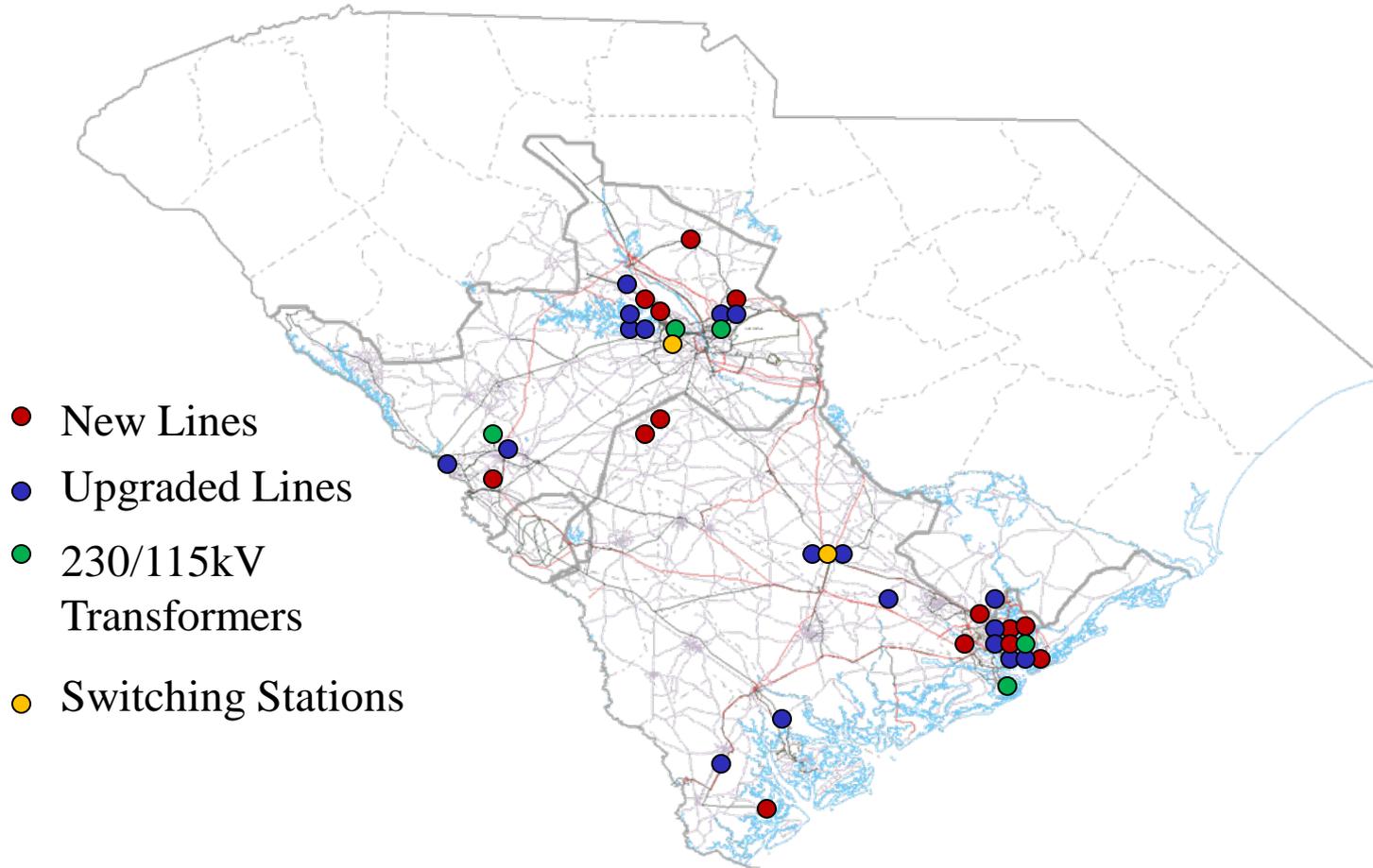
- The projects described in these presentations represent the current transmission plans within the SCRTP footprint.
- The expansion plan is continuously reviewed and may change due to changes in key data and assumptions.
- This presentation does not represent a commitment to build.

SCE&G Transmission Projects

Project Scheduled for Completion in 2013

- Lake Murray 230/115 kV Sub Add 2nd Autotransformer
- Hagood Jct-Charlotte Street 115 kV Rebuild
- Callawassie Convert from 46 kV to 115 kV
- Belvedere - Stevens Ck 115 kV Rebuild as Double Circuit
- Bayview-Charlotte St 115 kV #2 Underground Cable Construct
- Faber Place Replace Switch House
- Graniteville Replace 2 46 kV PRCB's & add 2 230 kV PRCB's
- Hamlin - Isle of Palms 115 kV Underground Cable Construct

SCE&G Planned Projects



VC Summer Nuclear Unit #2 Related Projects

- VCS1 - Killian 230 kV Line Construct Dec 2014
- VCS2 - Lake Murray #2 230 kV Line Construct April 2015
- Denny Terrace - Lyles 230 kV Line Upgrade April 2015
- Saluda River 230/115 kV Substation May 2015
- Lake Murray - McMeeKin 115 kV Line Upgrade May 2015
- Lake Murray - Saluda 115 kV Line Upgrade May 2015
- Saluda - McMeeKin 115 kV Line Upgrade May 2015

VC Summer Nuclear Unit #3 Related Projects

- St George 230 kV Switching Station Construct May 2017
- St George - Canadys 230 kV Line Upgrade May 2017
- St George - Summerville 230 kV Line Upgrade May 2017
- VCS2- St George 230 kV Double Circuit Construct May 2017

Bayview-Charlotte Street 115 kV #2 Underground Cable Construct

Project ID

0502

Project Description

Add 2nd underground cable from Bayview to Charlotte Street

Project Need

System load growth in Mt Pleasant area requires additional transmission capacity from the Charleston Peninsula.

Project Status

Under Construction

Planned In-Service Date

12/1/2013

Estimated Project Cost (\$)

Previous	2013	2014	2015	2016	2017	Total
\$427,606	\$4,672,394	\$0	\$0	\$0	\$0	\$5,100,000

Bayview-Mt Pleasant 115 kV Line Rebuild

Project ID

1269A

Project Description

Upgrade the overhead portion of the Mt pleasant to Bayview 115kV line

Project Need

Load growth in the Isle of Palms and Hamlin areas require additional transmission capacity from the Mt Pleasant Source.

Project Status

Under Construction

Planned In-Service Date

12/1/2014

Estimated Project Cost (\$)

Previous	2013	2014	2015	2016	2017	Total
\$427,606	\$4,672,394	\$0	\$0	\$0	\$0	\$5,100,000



STONE2

3KAPSTONE
6 MW
9 Mvar

3KAPSTONE ST
85 MW
9 Mvar

3TOM ISL1

3TOM ISL2

13 MW 2 Mvar
18 MW 2 Mvar
15 MW 0 Mvar

3HAMLIN T

29 MW 4 Mvar
3 MW 0 Mvar
29 MW 5 Mvar
9 MW 1 Mvar
10 MW 1 Mvar

3HAMLIN

3SEWE RD

18 MW 5 Mvar
0 MW 0 Mvar

3HOBCAW 3WANDO

18 MW 10 Mvar
17 MW 1 Mvar

0.0 Mvar

3MT PLST1

3MT PLST2

61.7 Mvar

27 MW 4 Mvar
27 MW 4 Mvar

3RIFLRNG

3OSCEO T

18.9% loaded

45.5% loaded

3MEET ST

3PORT AU
????? Mvar

3PORTS T

3BAY CBL

21 MW 3 Mvar

3BAYVIEW

28 MW 6 Mvar

3BEE ST1

3W SIDE

3CHAR ST1

19 MW 5 Mvar

3OSCEOLA

14 MW 5 Mvar

3RIFLRNG

3OSCEO T

14 MW 1 Mvar

3IS PALM

15 MW 3 Mvar

SCRTP

SCE&G Planned Projects (2018-2023)

- Canadys – Church Creek 230 kV line Construct May 2020
- Queensboro 230/115 kV Substation Construct May 2020
- Lexington Junction 115 kV Switching Station May 2022

Current Transmission Expansion Plans

Santee Cooper

William Gaither

Transmission Network

Completed Projects

- Carolina Forest-Dunes #2 115 kV Line 12/2012
- Fold Hemingway-Marion 230 kV into Lake City 11/2012
- Cane Bay Tap-Sangaree Tap 115 kV Line 04/2013

Transmission Network

Active Projects

- Orangeburg 230-115 kV Substation 06/2013
- Pomaria 230-69 kV Substation 06/2013
- Fold Newberry-VCS 230 kV into Pomaria 06/2013
- Bucksville 230-115 kV Substation 06/2014
- Winyah-Bucksville 230 kV Line 06/2015

Transmission Network

Active Projects

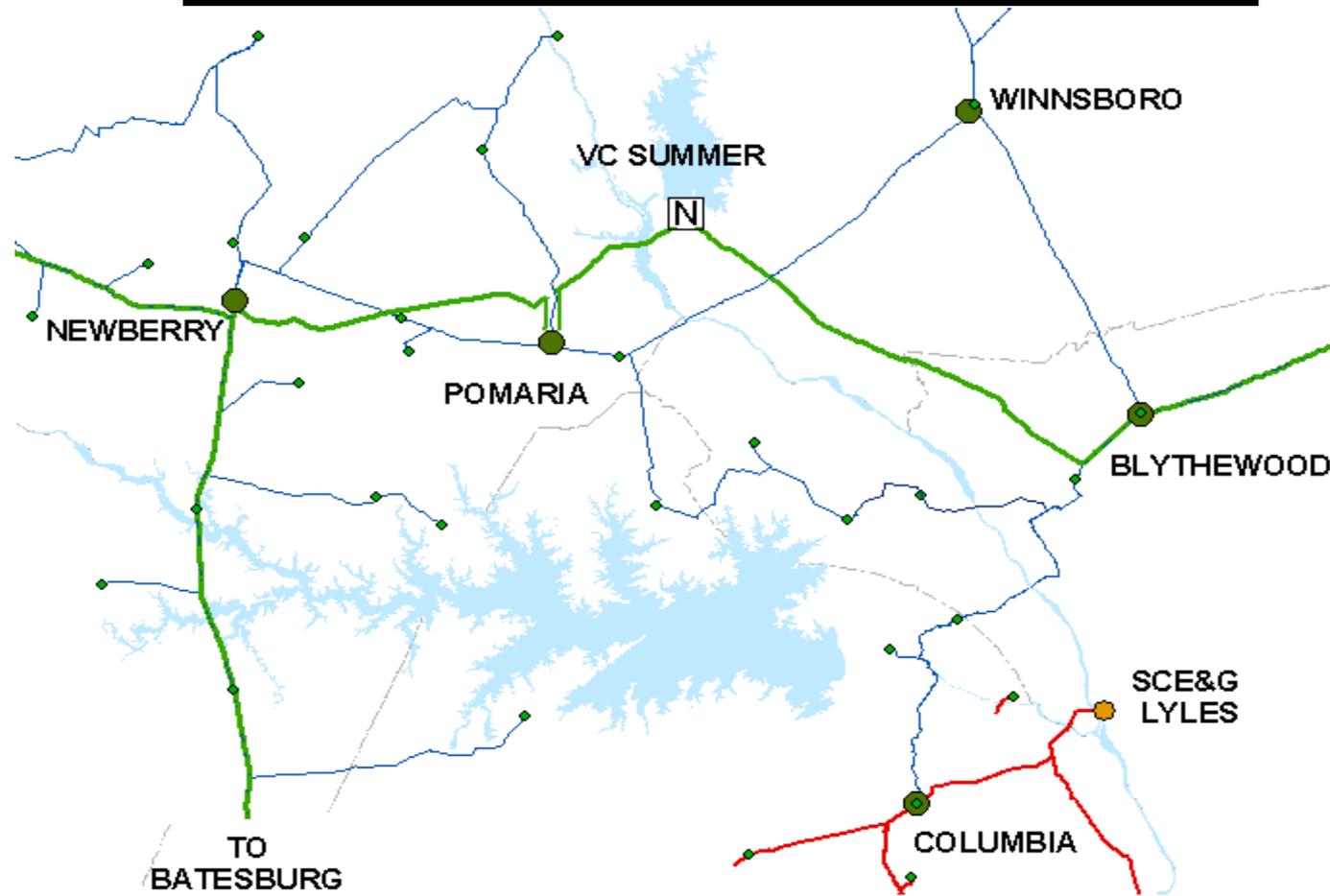
- Winnsboro 230-69 kV Substation 09/2013
- VCS-Winnsboro 230 kV Line 11/2013
- Richburg 230-69 kV Substation 06/2014
- Winnsboro-Richburg 230 kV Line 08/2014
- Richburg-Flat Creek 230 kV Line 10/2015

Orangeburg-St. George-Varnville Area

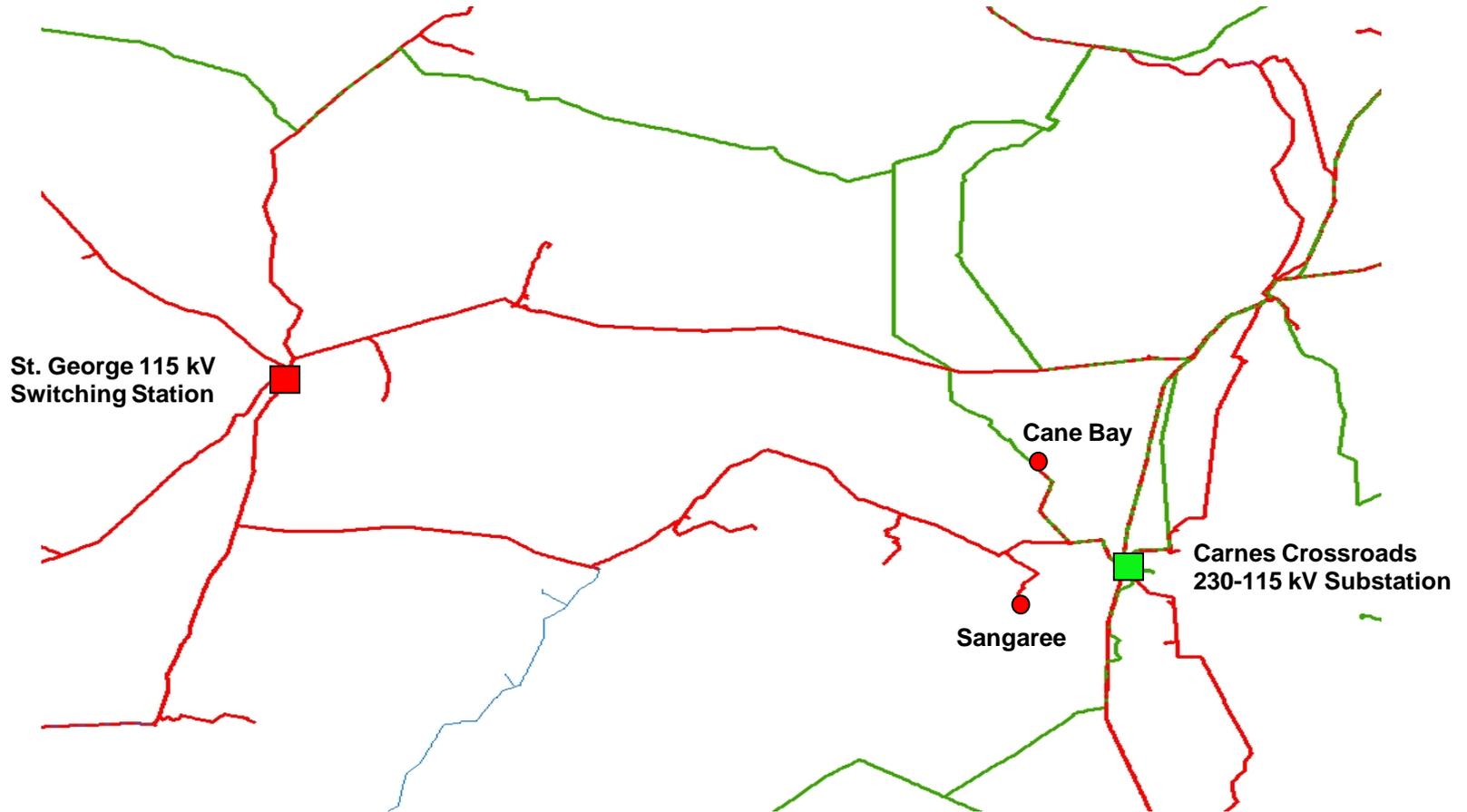


**Orangeburg
230/115 kV
Sub**

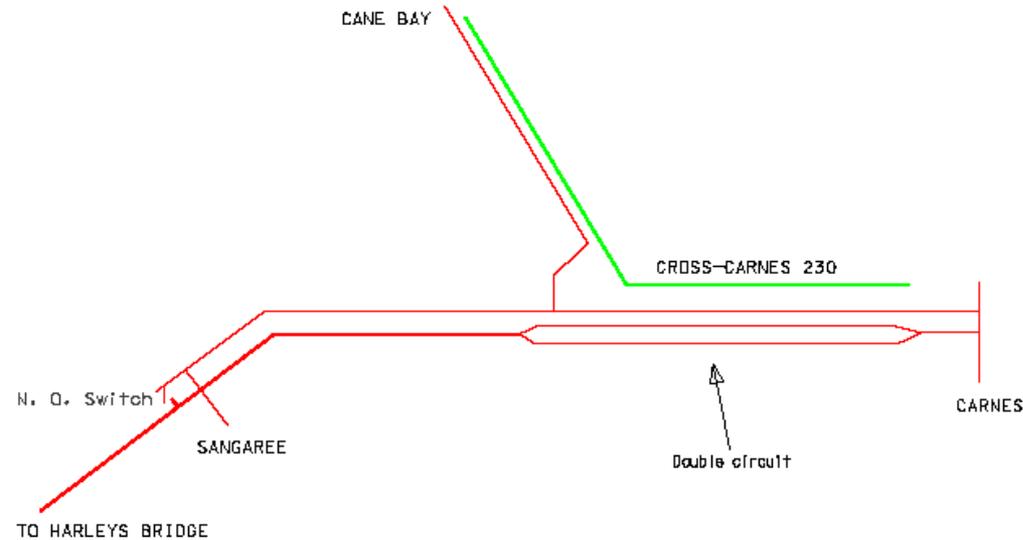
Pomaria 230-69 kV Substation



Carnes-St. George Area

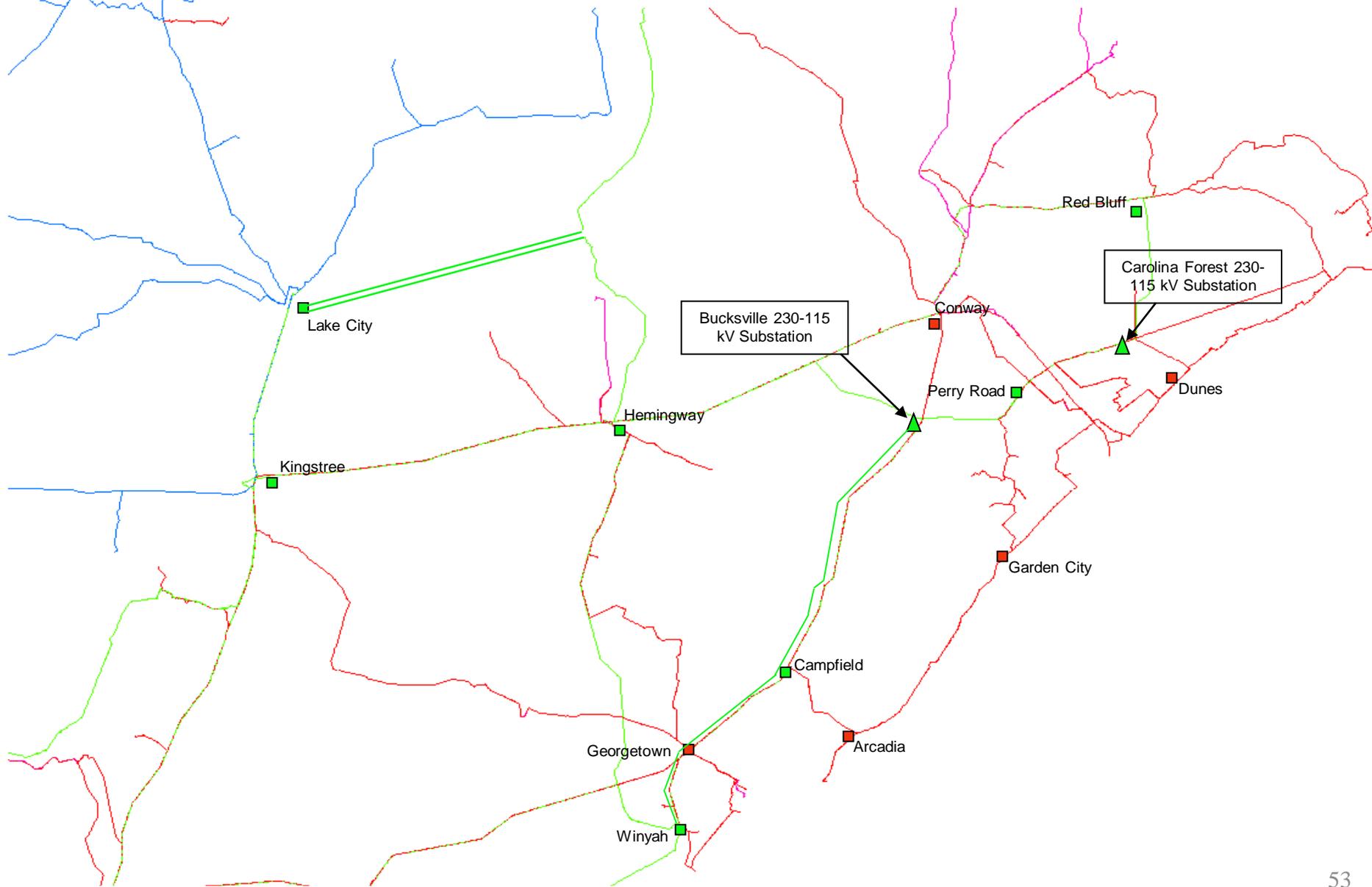


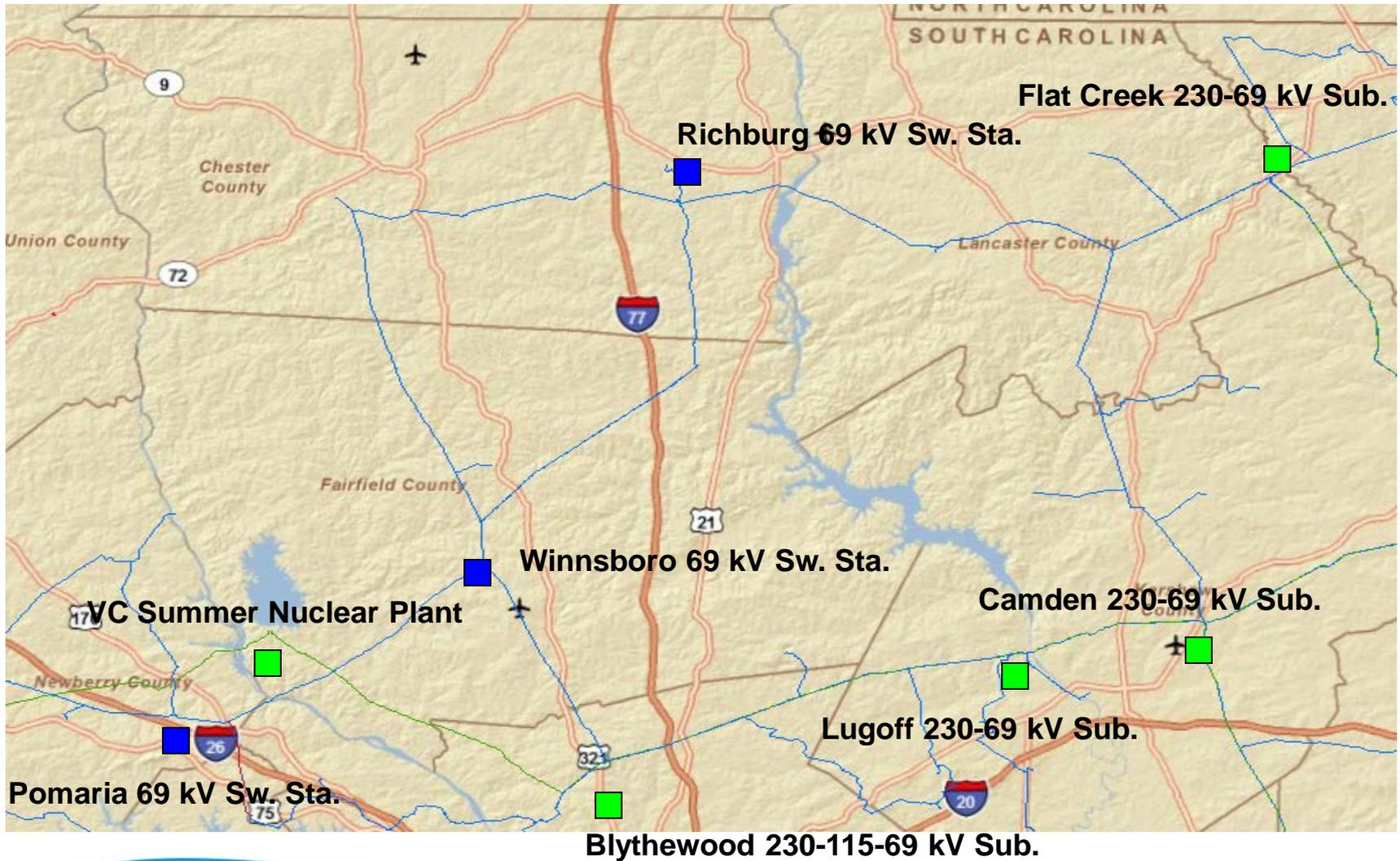
Carnes-Sangaree Tap 115 kV Line

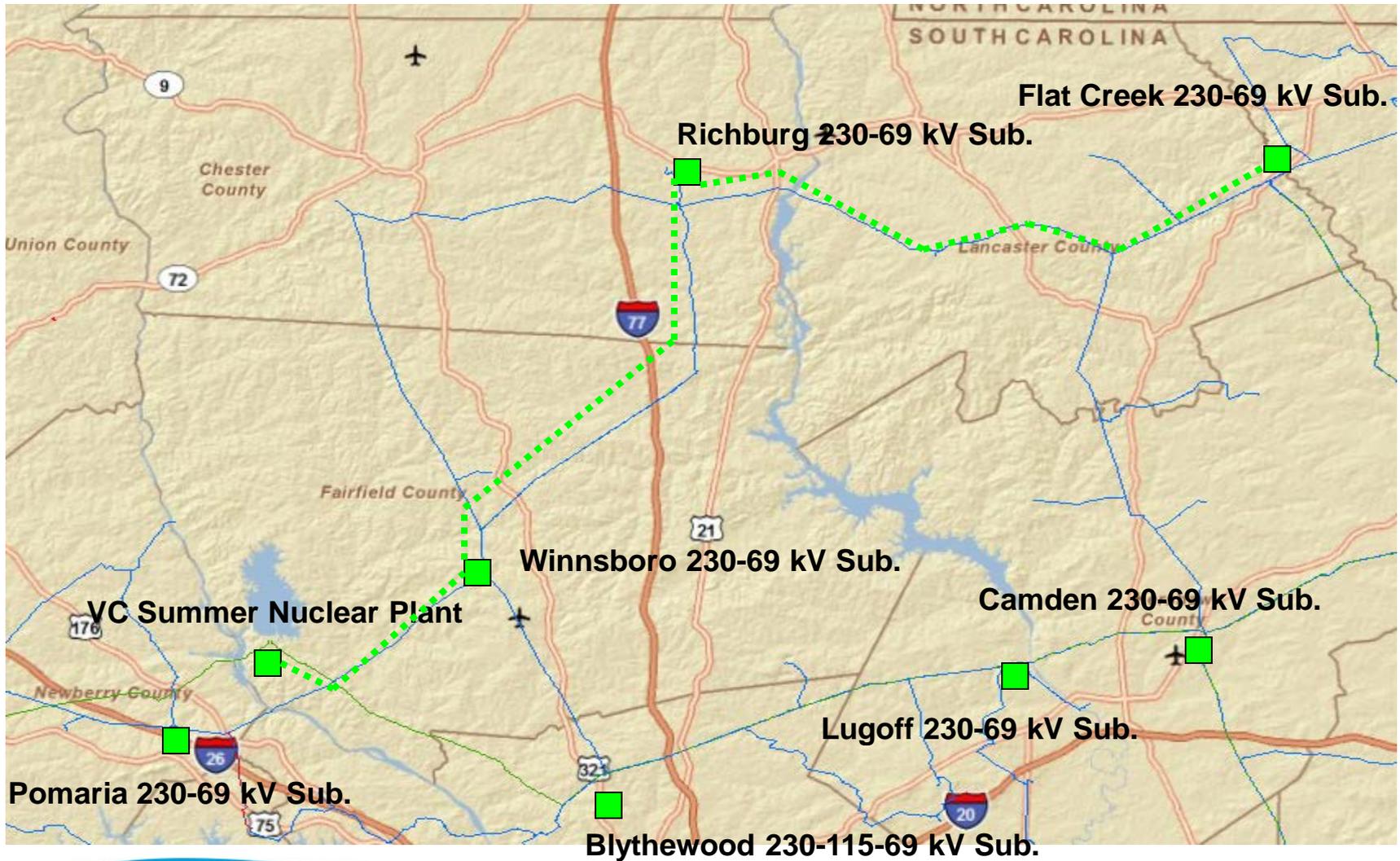


Carnes-Sangaree Tap 115 kV Double Circuit Rebuild
Figure 2

Bucksville 230-115 kV Substation





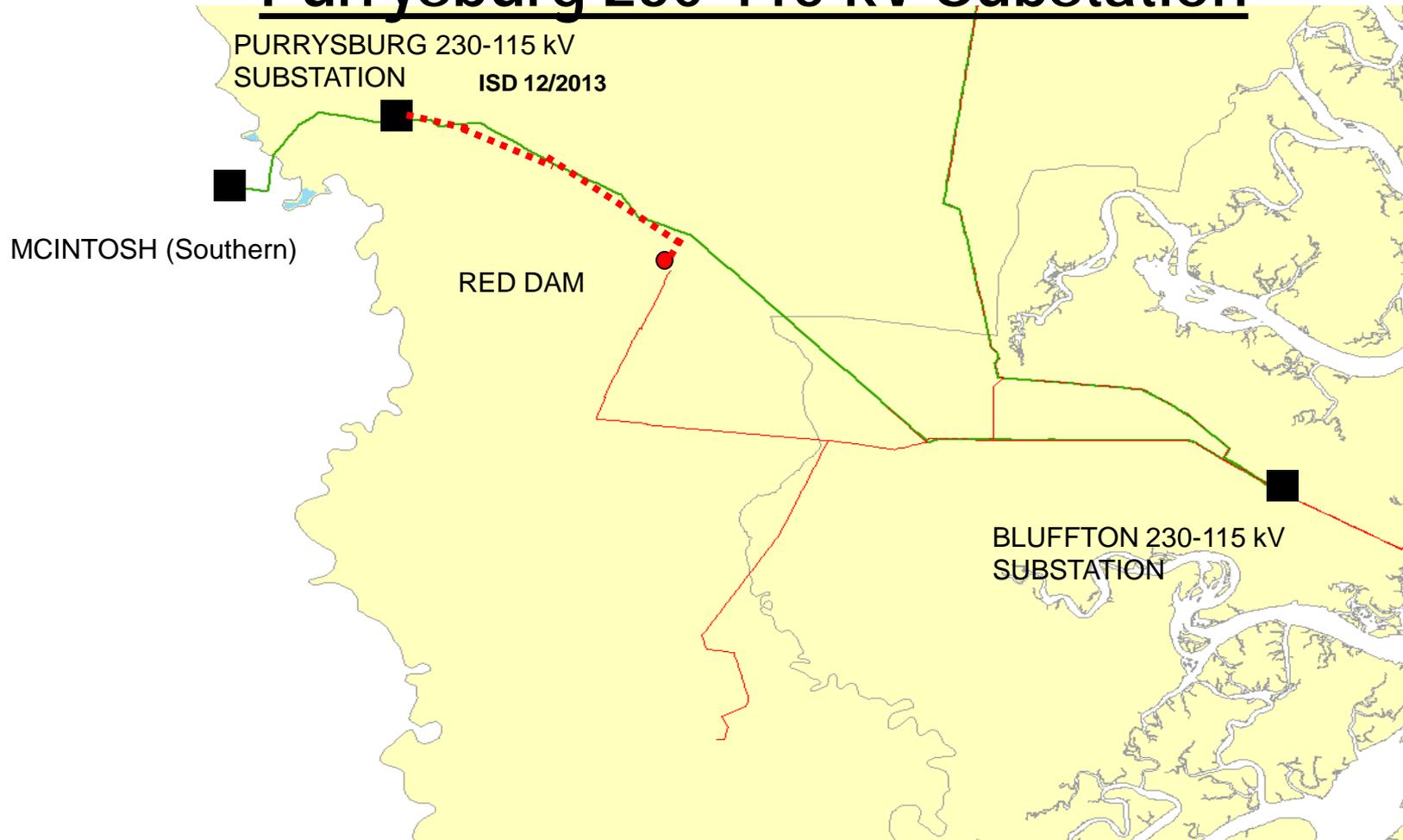


Transmission Network

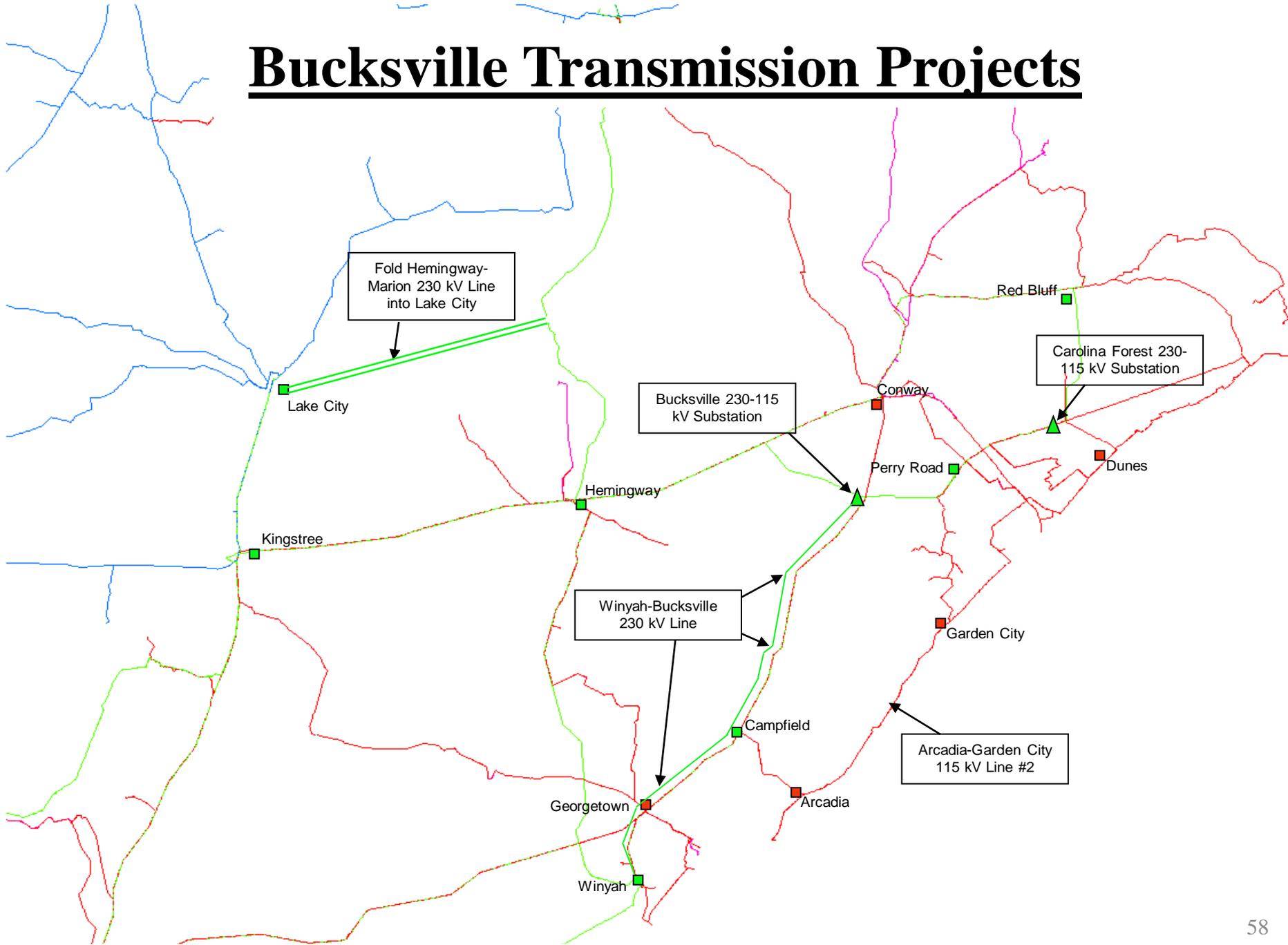
Planned Projects

- Purrysburg 230-115 kV Substation 11/2014
- Bucksville-Garden City 115 kV Line 06/2016
- Wassamassaw 230-115 kV Substation 06/2017
- Cross-Wassamassaw #2 230 kV Line 06/2018
- Marion-Red Bluff 230 kV Line 12/2019
- Transmission Plans Associated with VCS #3

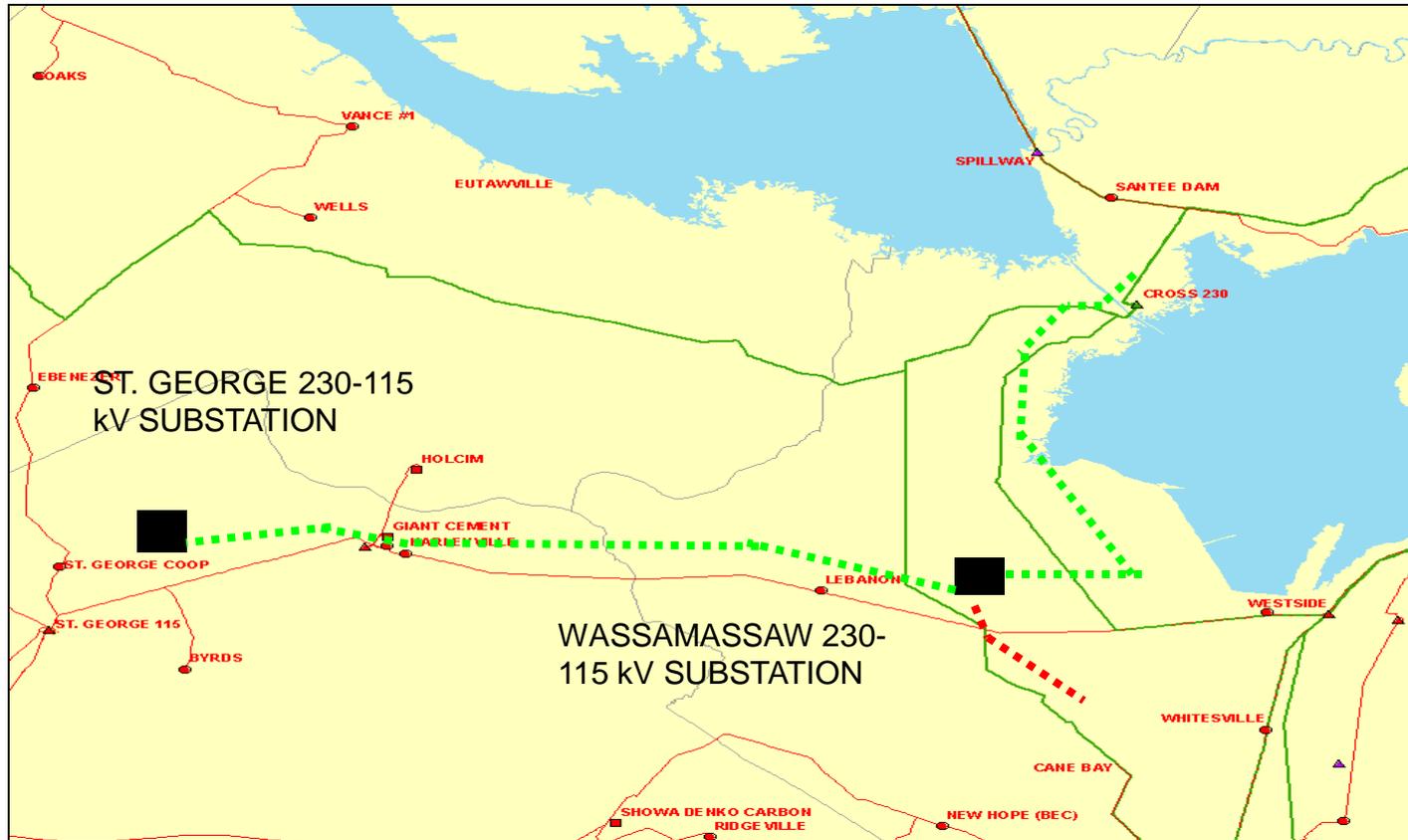
Purrysburg 230-115 kV Substation



Bucksville Transmission Projects



Wassamassaw 230-115 kV Substation ISD 6/2017



Marion-Red Bluff 230 kV Line



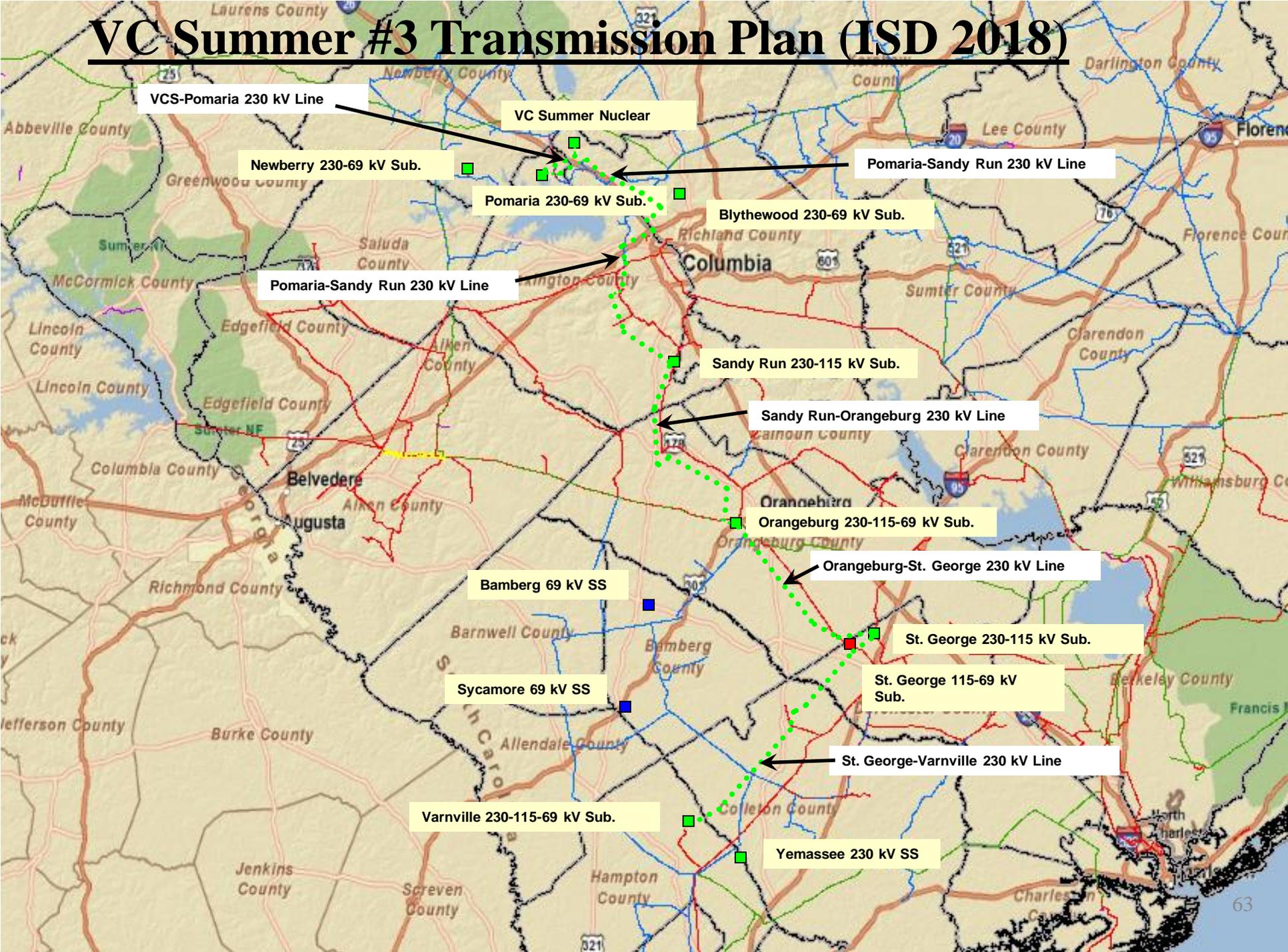
VCS #3 Transmission Projects

- VCS-Pomaria #2 230 kV Line 05/2014
- Sandy Run 230-115 kV Substation 04/2016
- Pomaria-Sandy Run 230 kV Line 05/2016
- Sandy Run-Orangeburg 230 kV Line 05/2017
- St. George 230-115 kV Substation 04/2018
- Orangeburg-St. George 230 kV Line 05/2018
- Varnville 230-115 kV Substation 05/2019
- St. George-Varnville 230 kV Line 06/2019

VC Summer #3 Transmission Plan (ISD 2018)



VC Summer #3 Transmission Plan (ISD 2018)



Current Transmission Expansion Plans

Stakeholder Input, Comments and Questions

Key Planning Data and Assumptions for the Next Planning Cycle

SCE&G

Phil Kleckley

Modeling Assumptions and Data

Dispersed Substation Load Forecast

- Summer/Winter Peak, Off-Peak and Seasonal Load Levels
- Resource Planning provides 10 Year system load forecasts
- Transmission Planning creates dispersed substation load forecasts

Load Forecast Process

Resource Planning Input

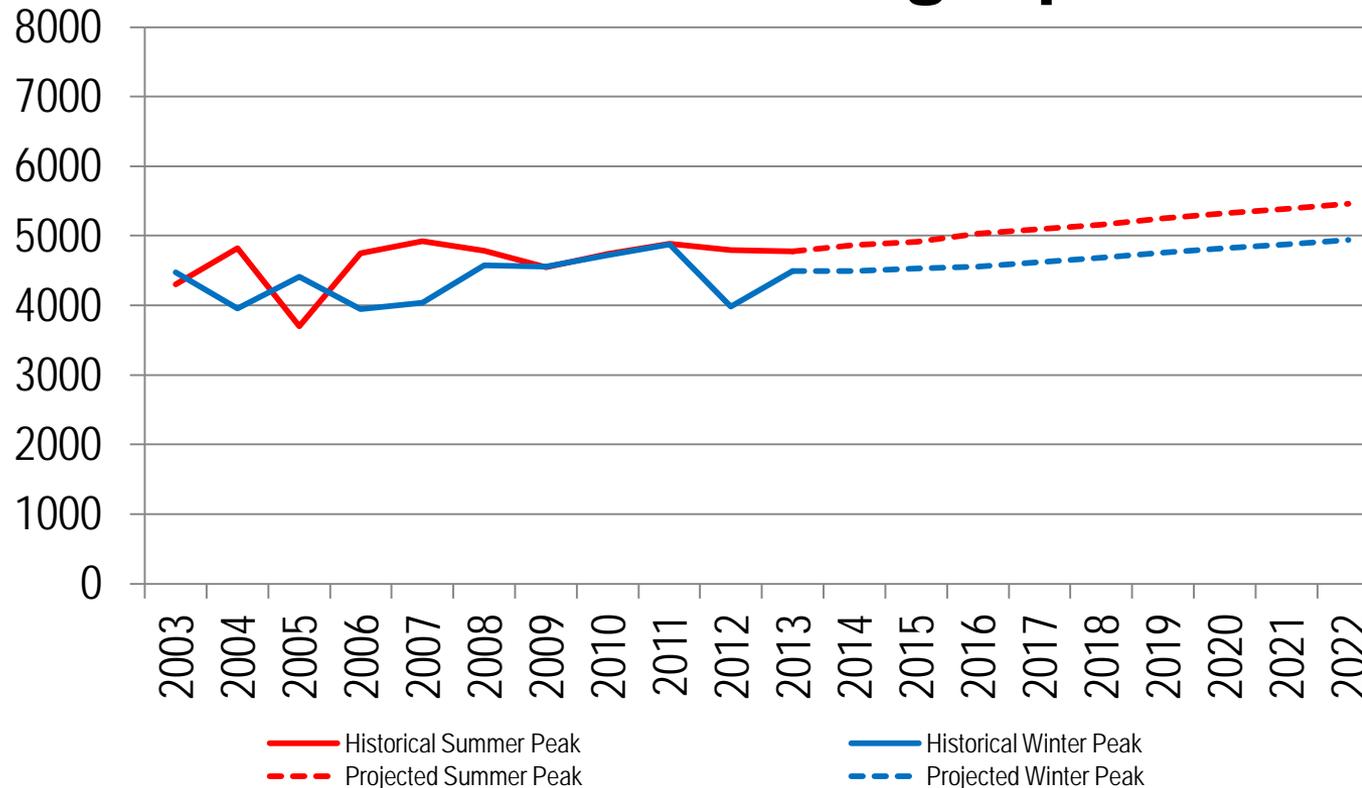
- Develop 10 year projected forecast based on:
 - 10 year historical load summer and winter loads
 - Load factors by customer class
 - Considers weather, personal income, population growth, economic conditions, load management, energy efficiency, etc
 - Applies regression analysis to historical data to develop models
 - Applies forecasted growth rates to develop future projections

SCE&G 10 Year Load Forecast

	<u>Summer</u>		<u>Winter</u>
2013	4,778 MW	2012/2013	3,984 MW
2014	4,868 MW	2013/2014	4,491 MW
2015	4,909 MW	2014/2015	4,495 MW
2016	5,034 MW	2015/2016	4,530 MW
2017	5,096 MW	2016/2017	4,561 MW
2018	5,161 MW	2017/2018	4,625 MW
2019	5,248 MW	2018/2019	4,688 MW
2020	5,325 MW	2019/2020	4,759 MW
2021	5,388 MW	2020/2021	4,820 MW
2022	5,463 MW	2021/2022	4,874 MW

Load Forecast Process

Resource Planning Input



Load Forecast Process

Transmission Planning Input

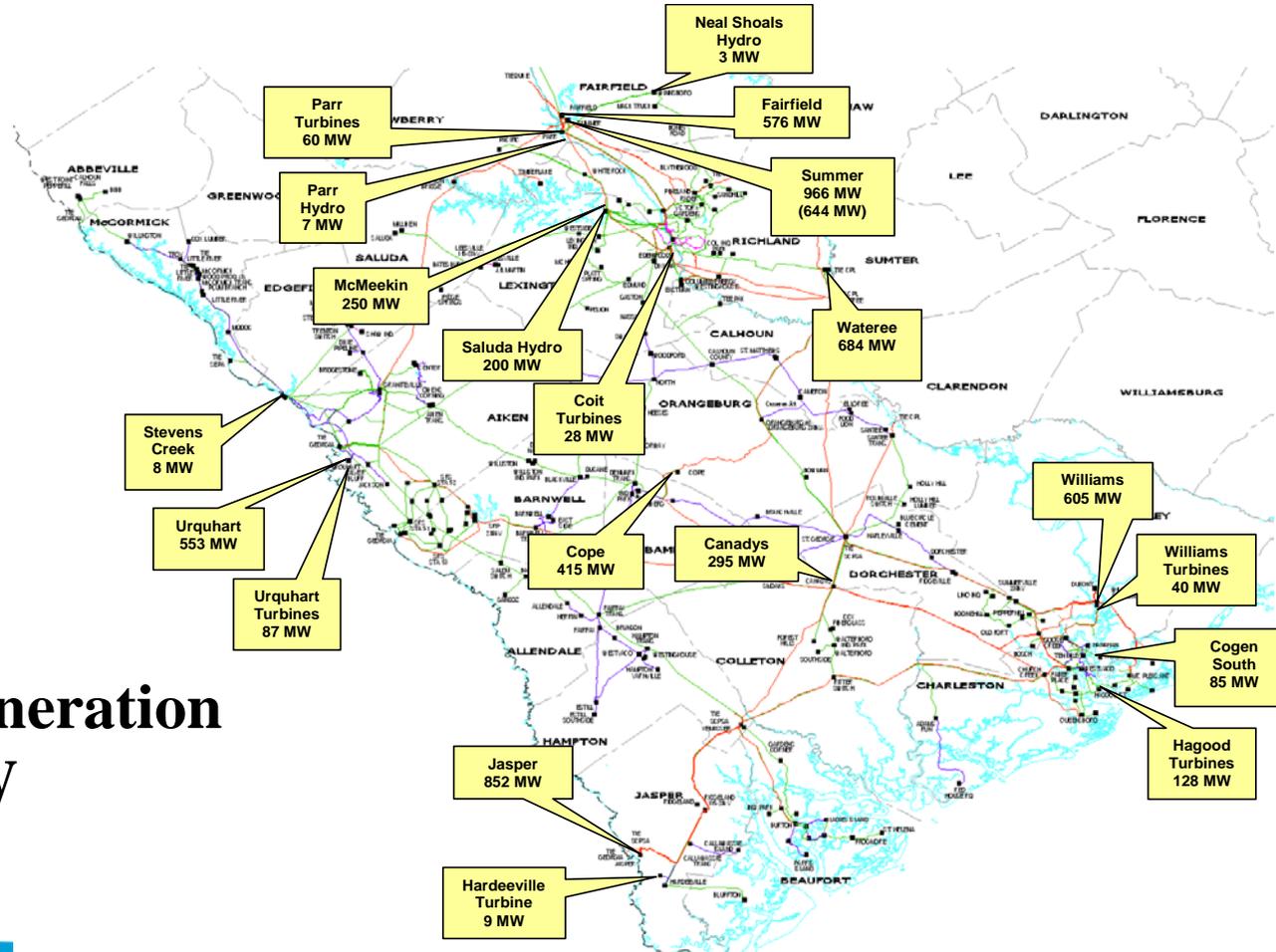
- Obtain summer and winter snapshot meter data from most recent seasons and adjust for load switching
- Develop 10 year projected forecast based on:
 - 10 year historical loading
 - Feedback from Distribution Planning, Local Managers, Large Industrial Group and Transmission Services Manager
- Wholesale loads are modeled as provided by the customer
- Dispersed forecasted load points are integrated into Corporate forecasted load

Modeling Assumptions and Data

Generation

- Annual generator ratings used
- Input from Generation Expansion Plan – Reductions/Additions
- Input from Generation Maintenance Schedule
- Generators dispatched economically
- Merchant Generators included

Existing Generation



Rated Generation
5,529 MW

Generation Plan

Reductions

- 90 MW Coal 2013
- 245 MW Coal 2017
- 345 MW Coal 2018

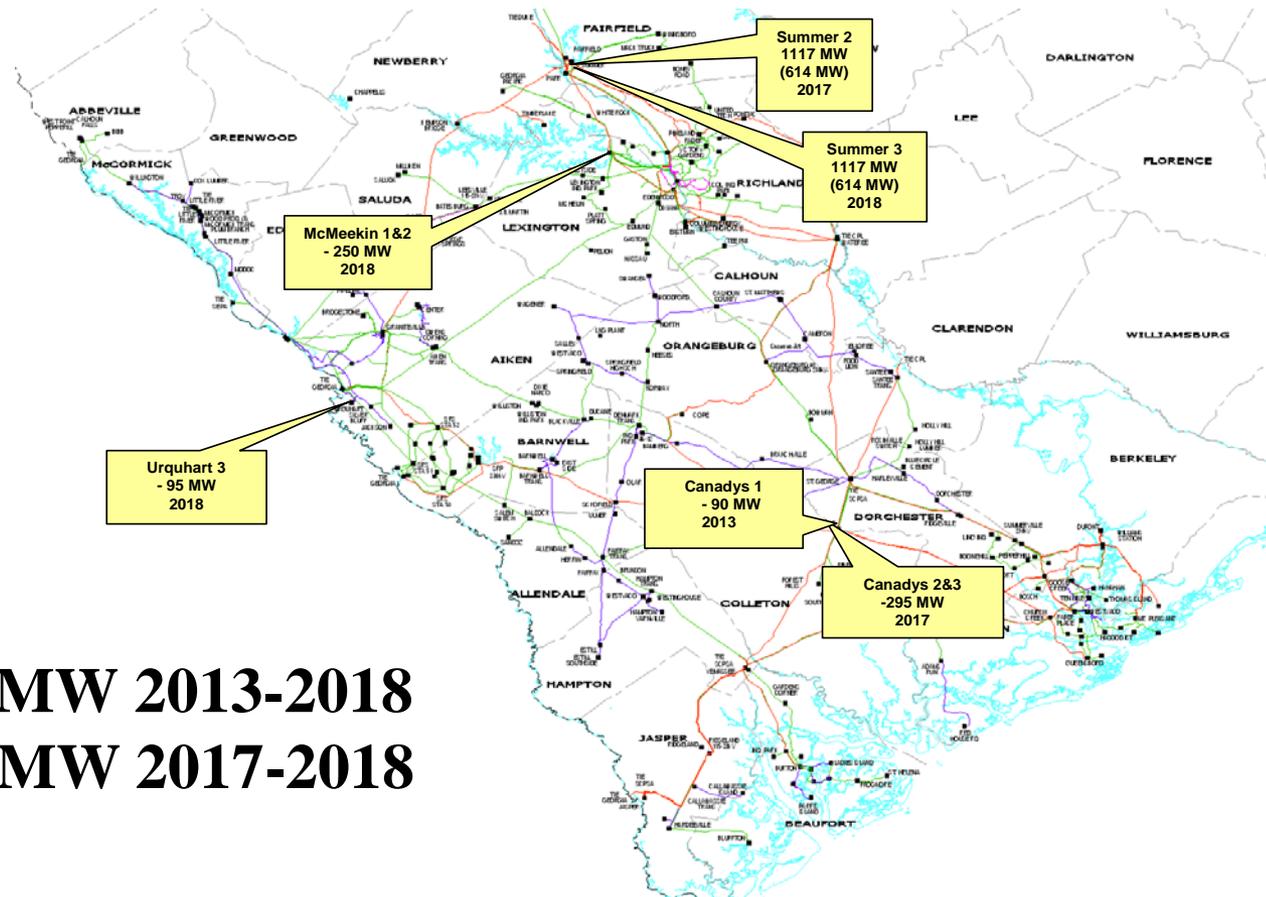
Generation Plan

Additions

- 1117 MW of SCE&G/Santee Cooper Base Load Nuclear Generation planned for 2017 (V. C. Summer)
- 1117 MW of SCE&G/Santee Cooper Base Load Nuclear Generation planned for 2018 (V. C. Summer)

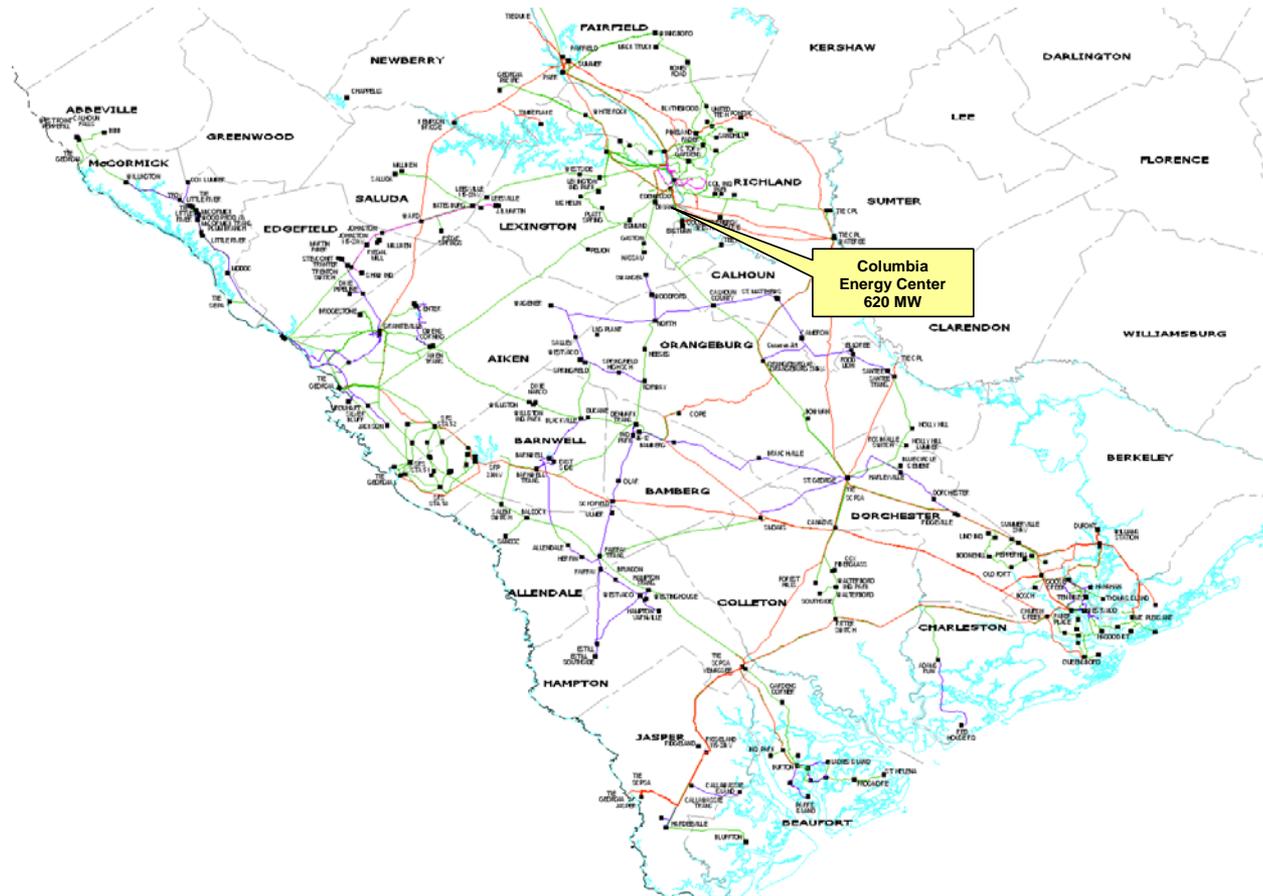


Generation Changes



- 730 MW 2013-2018
+ 1228 MW 2017-2018

Merchant Generation



Modeling Assumptions and Data

Transmission Network

- Input from Transmission Plan
- Neighboring Transmission Systems Modeled

Modeling Assumptions and Data

Planned Transmission Facilities

South Carolina Electric & Gas Planned Transmission Facilities

Planned Project	Tentative Completion Date
VCS1 add Back-to-Back Bus Tie Breakers Buses 1 and 2	Apr-13
VCS2 230kV Switchyard Construct	Apr-13
Lake Murray 230/115kV Sub Add 2nd Autobank	May-13
VCS2-Denny Terrace 230kV Re-terminate	May-13
Eutawville 115kV Line Construct	May-13
Charlotte St – Hagood 115kV Line Construct	May-13
Edenwood – Columbia Industrial Park 115kV Upgrade	May-13
Eastover – Wateree 115kV Line Improve	May-13
Belvedere – Stevens Ck 115kV Line Rebuild as Double Circuit	May-13
Callawassie Line Convert from 46 kV to 115 kV	Aug-13
VCS2 – Lake Murray 230kV #2 Line Construct	Oct-13
Hamlin – Hungryneck 115V Line Construct	Dec-13

Modeling Assumptions and Data

System Interchange

- Firm scheduled transfers included
- Coordinated with Neighbors

Key Planning Data and Assumptions for the Next Planning Cycle

Santee Cooper

William Gaither

Components

- Demand Forecast
- Transmission Network
- Generation Resources
- Actual System Operations

Demand Forecast

Load forecast is developed with contributions from:

- Santee Cooper (retail, industrial)
- Central Electric Power Cooperative, Inc. (retail, industrial)
- Cities of Bamberg and Georgetown (municipal)

Transmission Network

Models include:

- Existing transmission system as well as committed Santee Cooper additions (uncommitted facilities are subject to change in scope or date).
- Confirmed firm PTP transmission service reservations
- Neighboring transmission system representations.
- All facilities assumed to be available for service.
- Normal operating status (in-service or OOS) of facilities is represented.

Transmission Network

- Uniform rating methodology is applied to transmission facilities.
- Base case models are updated annually.
- Study models may be updated prior to any study effort.

Planned Transmission Facilities

• Cane Bay-Sangaree Tap 115 kV Line	06/01/2013
• Orangeburg 230-115kV Substation	06/01/2013
• Pomaria 230/69kV Substation	06/01/2013
• Winnsboro 230-69 kV Substation	09/30/2013
• VC Summer-Winnsboro 230 kV Line	12/01/2013
• Purrysburg 230-115kV Substation	12/31/2013
• Bucksville 230-115 kV Substation	06/01/2014
• Richburg 230-69 kV Substation	06/01/2014
• VC Summer-Pomaria 230 kV #2 Line	06/01/2014
• Bucksville 230-115 kV Substation	06/01/2014
• Winnsboro-Richburg 230 kV Line	09/01/2014
• Winyah - Bucksville 230 kV Line	06/01/2015
• Richburg-Flat Creek 230 kV Line	10/01/2015
• Bucksville-Garden City 115kV Line	06/01/2016
• Sandy Run 230-115 kV Substation	05/01/2017
• Pomaria-Orangeburg 230 kV Line	05/01/2017

Generation Resources

Existing Connected Generation

Cross 1- 4

Grainger 1, 2

Hilton Head Turbines 1- 3

Jefferies 1, 2, 3, 4, 6 (Hydro)

Jefferies 1, 2, 3, 4 (Steam)

Myrtle Beach Turbines 1-5

Winyah 1-4

J.S. Rainey Power Block 1

J.S. Rainey 2A, 2B

J.S. Rainey 3-5

Spillway (Hydro)

St. Stephen 1-3 (Hydro)

V.C. Summer #1

Generation Resources

Projected New Capacity in Models

V. C. Summer #2 (03/2017)

V. C. Summer #3 (05/2018)

Key Planning Data and Assumptions

Stakeholder Input, Comments and Questions

Economic Transmission Planning Studies Initial Findings

Kale Ford

Study Methodology

In accordance with the requirements of NERC Standards FAC-012-1 and FAC-013-1, the transfer capability determination in this study is consistent with traditional Transfer Capability Methodologies.

Two types of studies:

- Linear transfer analysis using PTI's MUST Software. Analysis includes single contingencies of SERC while monitoring SCE&G and Santee Cooper Transmission Systems.

Study Methodology

- A Thermal and Voltage analysis using PTI's PSS/E and/or PowerWorld Simulator Software. This analysis of SCE&G and Santee Coopers internal transmission systems included single contingencies, double contingencies and selected bus outages with and without the simulated transfer in effect. However, this analysis is not a complete testing of NERC TPL standards.

Case Development

- The most current MMWG models were used for the systems external to SCE&G and SCPSA as a starting point for the study case.
- The study case(s) include the detailed internal models for SCE&G and SCPSA. The study case(s) as include new transmission additions currently planned to be in-service for the given year (i.e. in-service by summer 2017 for 2017S case).

Case Development

- SCE&G and SCPSA have coordinated interchange which includes all confirmed long term firm transmission reservations with roll-over rights applicable to the study year.
- The coordinated cases were used to build base cases.
- Base cases were used to build transfer cases.

Study Results

- SCE&G and SCPSA have reported results based on thermal loading greater than 90% and voltage violations in accordance with their planning criteria.
- Overloaded facilities that had a low response to the requested transfer were excluded and problems or issues identified that are local area in nature were also excluded.

Stakeholder Selected Studies

Source	Sink	Study Year	Transfer
Southern Company	Santee Cooper	2014 Summer	500 MW
Southern Company	Santee Cooper	2014 Winter	500 MW
SCE&G	Progress Energy Carolinas	2018 Summer	200 MW
SCE&G	Southern Company	2018 Summer	200 MW
SCE&G	Southern Company	2023 Summer	200 MW

Study Assumptions

- Generation was dispatched for each Participant company in the study case to meet the transfer in accordance with their economic dispatch order. Transfers above available generation are simulated by load scaling in the exporting area.
- Load growth assumptions are in accordance with each Participant company's practice.
- Generation, interchange, and other assumptions are coordinated between the Participant companies as needed.
- The 2012 series MMWG cases for 2014 Summer, 2014 Winter, 2018 Summer and 2023 Summer were used as the starting points for base case and transfer case development.

Preliminary Result Components

- The following information is preliminary and subject to change pursuant to additional analyses.
- The following information does not represent a commitment to proceed with the recommended enhancements nor implies that the recommended enhancements could be implemented by the study dates.
- These potential solutions only address constraints identified within the respective areas that comprise the SCRTP. Balancing Areas external to the SCRTP were not monitored, which could result in additional limitations and required system enhancements.

Preliminary Results

Southern Company-Santee Cooper 500 MW 2014 Summer Study

Constrained Facility	Loading %	Increase %	Contingency	Project
Purrysburg 230/115 kV	132.0	10.6	Bluffton-Purrysburg 230 kV (Operating Guide: Open Purrysburg 230/115 kV)	
AM Williams-Canadys 230 kV	91.5	12.1	Canadys-Church Creek 230 kV and AM Williams Generator	P0
Canadys-Church Creek 230 kV	102.4	11.3	AM Williams 230 kV Bus	P1
Canadys-Church Creek 230 kV	98.7	15.2	AM Williams-Canadys 230 kV and Church Creek-Ritter 230 kV	P1
Church Creek-Faber Place 115 kV	93.2	23.9	Church Creek-Faber Place 230 kV and Church Creek-Savage Road 115 kV	P2

Preliminary Results

Southern Company-Santee Cooper 500 MW 2014 Summer Study

Project	Description	Cost (2013\$)	Duration (Months)
P0	Rebuild AM Williams-Canadys 230 kV ~49 Miles of 230 kV transmission with B-1272 ACSR	\$30,300,000	36
P1	Rebuild Canadys-Church Creek 230 kV ~37 Miles of 230 kV transmission with B-1272 ACSR	\$22,700,000	36
P2	Rebuild Church Creek-Faber Place 115 kV ~4 Miles of 115 kV transmission with 1272 ACSR	\$2,400,000	24
TOTAL (2013\$)		\$55,400,000	

Preliminary Results

Southern Company-Santee Cooper 500 MW 2014 Winter Study

Constrained Facility	Loading %	Increase %	Contingency	Project
Purrysburg 230/115 kV	117.7	9.8	Bluffton-Purrysburg 230 kV (Operating Guide: Open Purrysburg 230/115 kV)	
AM Williams-Canadys 230 kV	100.2	25.6	Canadys-Church Creek 230 kV and AM Williams Generator	P0
Canadys-Church Creek 230 kV	118.1	32.0	AM Williams 230 kV Bus 1	P1
Canadys-Church Creek 230 kV	112.8	32.8	Mateeba-Pepperhill 230 kV and AM Williams Generator	P1
Faber Place-Pepperhill 230 kV	97.7	33.8	Canadys-Church Creek 230 kV and AM Williams-Northwoods Mall Tap 230 kV	P3
VC Summer 1 Bus 2-Newport 230 kV	92.6	9.9	Vogle-Savannah River Services 230 kV and VC Summer Nuclear Unit #1	P4
Lyles-Lexington 115 kV	91.6	6.9	Lyles-Silverlake 115 kV and VC Summer 1 Bus 1-Blythewood 230 kV	P5
Church Creek 230/115 kV 2	97.4	9.1	Church Creek 230 kV Bus 1	P6

Preliminary Results

Southern Company-Santee Cooper 500 MW 2014 Winter Study

Project	Description	Cost (2013\$)	Duration (Months)
P0	Rebuild AM Williams-Canadys 230 kV ~49 Miles of 230 kV transmission with B-1272 ACSR	\$30,300,000	36
P1	Rebuild Canadys-Church Creek 230 kV ~37 Miles of 230 kV transmission with B-1272 ACSR	\$22,700,000	36
P3	Rebuild Faber Place-Pepperhill 230 kV ~6.75 Miles of 115 kV transmission with 1272 ACSR	\$4,200,000	24
P4	Joint Study with Duke to determine best solution	*\$---	---
P5	Joint Study with Santee Cooper to determine best solution	*\$---	---
P6	Upgrade Church Creek Transformer – Accelerate 2 years	\$1,400,000	24
TOTAL (2013\$)		\$58,600,000+	

*Cost will have to be determined

+Cost will increase base on solutions produced by Joint Studies



Preliminary Results

SCE&G-Progress Energy Carolinas 200 MW 2018 Summer Study

Constrained Facility	Loading %	Increase %	Contingency	Project
Purrysburg 230/115 kV	129.4	-0.9	Bluffton-Purrysburg 230 kV (Operating Guide: Open Purrysburg 230/115 kV)	
Columbia Industrial Park-Edenwood 115 kV 2	90.4	3.8	Columbia Industrial Park-Edenwood 115 kV 1 and Lake Murray-Cromer Road Tap 115 kV	P7

Preliminary Results

SCE&G-Southern Company 200 MW 2018 Summer Study

Constrained Facility	Loading %	Increase %	Contingency	Project
Purrysburg 230/115 kV	127.7	-2.9	Bluffton-Purrysburg 230 kV (Operating Guide: Open Purrysburg 230/115 kV)	
Columbia Industrial Park-Edenwood 115 kV 2	90.7	3.1	Columbia Industrial Park-Edenwood 115 kV 1 and Lake Murray-Cromer Road Tap 115 kV	P7
Coit-Williams Street 115 kV	92.2	4.9	Edenwood-Lyles 230 kV and Edenwood-Lake Murray 230 kV	P8

Preliminary Results

SCE&G-Southern Company 200 MW 2023 Summer Study

Constrained Facility	Loading %	Increase %	Contingency	Project
Purrysburg 230/115 kV	134.8	-3.1	Bluffton-Purrysburg 230 kV (Operating Guide: Open Purrysburg 230/115 kV)	
Georgetown-Campfield 115 kV	108.0	0.1	Winyah-Campfield 230 kV (Operating Guide: Open Winyah 230/115 kV)	
Winyah-Campfield 230 kV	91.5	0.0	Bucksville-Winyah 230 kV	
Lyles-Lexington 115 kV	91.6	6.0	VC Summer Sub 2-Pomaria 230 kV 1 and VC Summer Sub 2-Pomaria 230 kV 2	P5

Preliminary Results

SCE&G-Southern Company 200 MW 2023 Summer Study

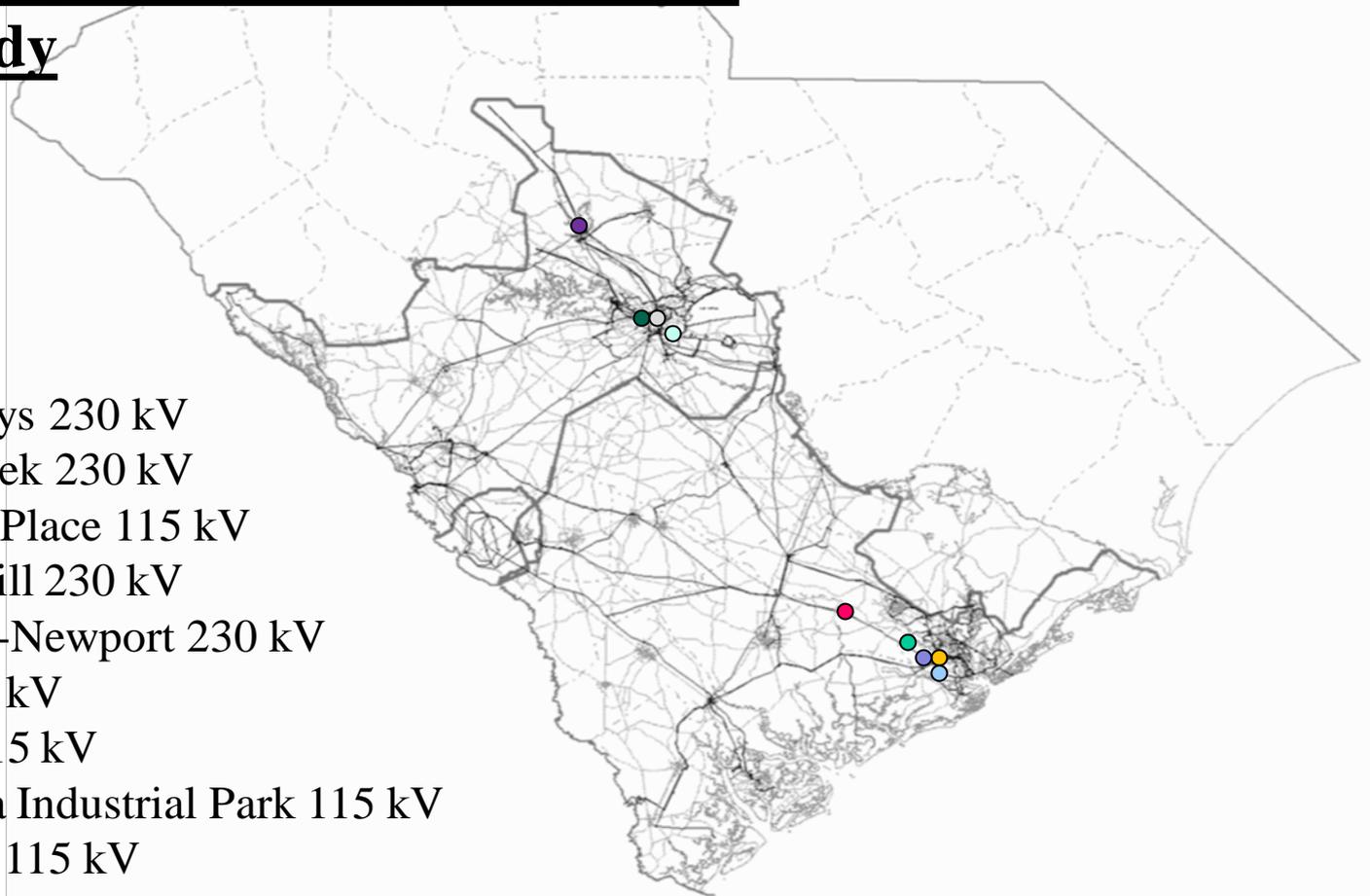
Project	Description	Cost (2013\$)	Duration (Months)
P5	Joint Study with Santee Cooper to determine best solution	*\$---	---
TOTAL (2013\$)		*\$---	

*Cost will have to be determined



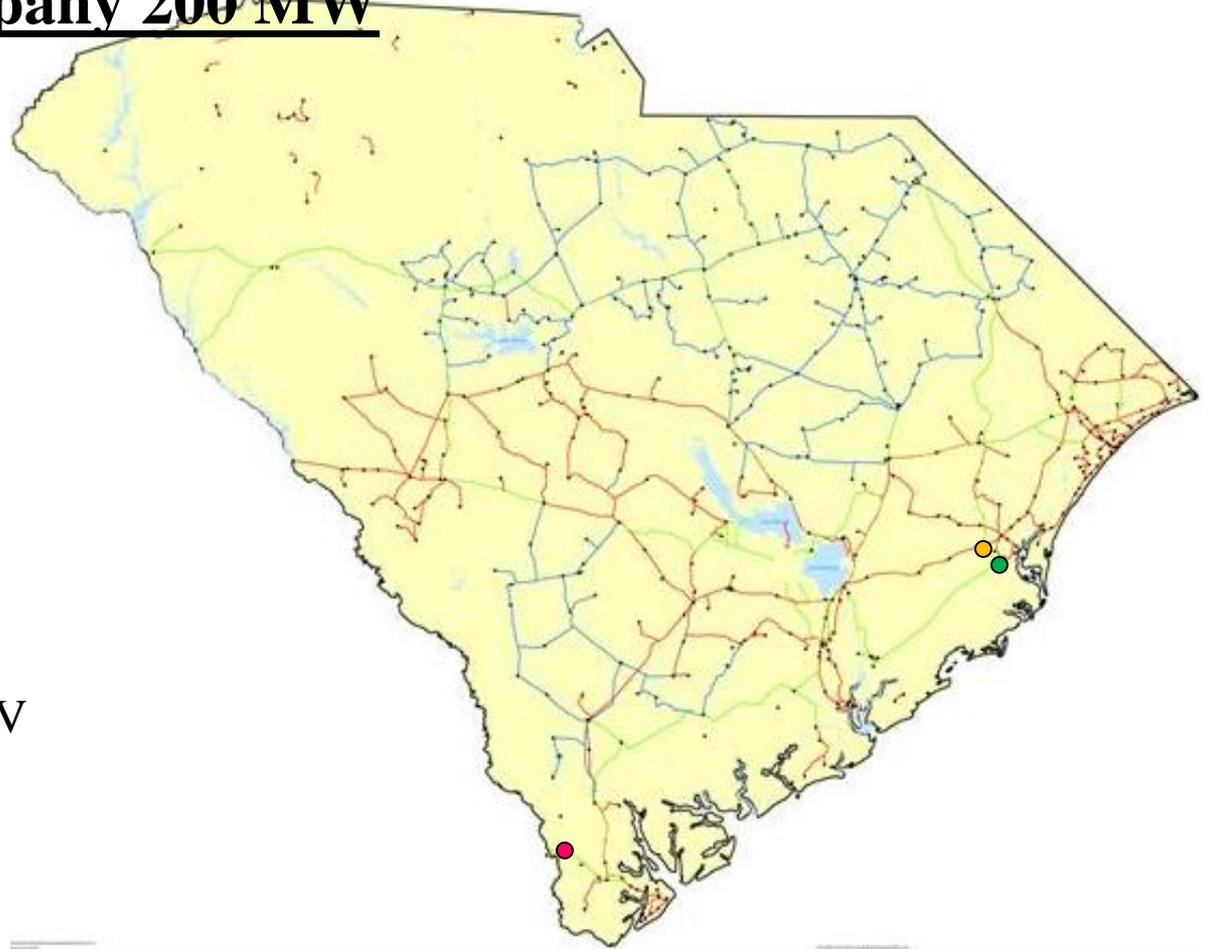
Southern Company-Santee Cooper 500 MW 2014 Winter Study

- AM Williams-Canadys 230 kV
- Canadys-Church Creek 230 kV
- Church Creek-Faber Place 115 kV
- Faber Place-Pepperhill 230 kV
- VC Summer 1 Bus 2-Newport 230 kV
- Lyles-Lexington 115 kV
- Church Creek 230/115 kV
- Edenwood-Columbia Industrial Park 115 kV
- Coit-Williams Street 115 kV



SCE&G-Southern Company 200 MW 2023 Summer Study

- Purrysburg 230/115 kV
- Georgetown-Campfield 115 kV
- Winyah-Campfield 230 kV



Stakeholder Input on Preliminary Results

- Study Refinements
- Other Solution Options
- Future Conference Call

Report and Power Flow Case Access

- Draft reports will be provided to stakeholders
- Comments sent to SCE&G by May, 15th 2013
- Power Flow Starting Point Cases available as of April 1, 2013

Economic Transmission Planning Studies Initial Findings

Stakeholder Input, Comments and Questions

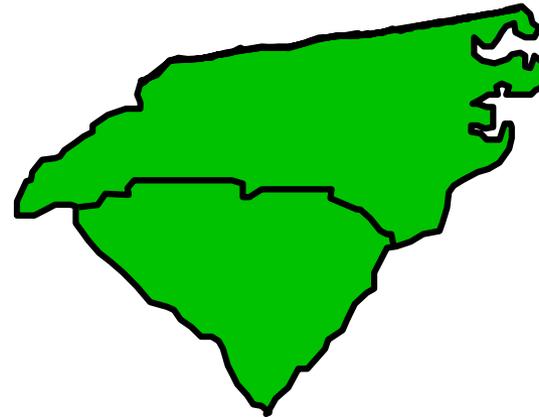
Reliability Assessment Studies

Jim Peterson

Multi-Party Assessments

- Carolina Transmission Coordination Arrangement (CTCA) Assessments
- SERC Assessments
- ERAG Assessments
- Two Party and Multi-Party Assessments

CTCA Future Year Assessments



CTCA Purpose

- Collection of agreements developed concurrently by the Principals, Planning Representatives, and Operating Representatives of multiple two-party Interchange Agreements
- Establishes a forum for coordinating certain transmission planning and assessment and operating activities among the specific parties associated with the CTCA

CTCA Purpose

Interchange Agreements associated with the CTCA

Duke Energy Carolinas (“Duke”) and Duke Energy Progress (“DEP”)

Duke Energy Carolinas (“Duke”) and South Carolina Electric & Gas Company (“SCE&G”)

Duke Energy Carolinas (“Duke”) and South Carolina Public Service Authority (“SCPSA”)

Duke Energy Progress (“DEP”) and South Carolina Electric & Gas Company (“SCE&G”)

Duke Energy Progress (“DEP”) and South Carolina Public Service Authority (“SCPSA”)

South Carolina Electric & Gas Company (“SCE&G”) and South Carolina Public Service Authority (“SCPSA”)

CTCA Power Flow Study Group

- Duke Energy Carolinas (“Duke”)
- Duke Energy Progress (“Progress”)
- South Carolina Electric & Gas (“SCEG”)
- South Carolina Public Service Authority (“SCPSA”)

CTCA Studies

Purpose

- Assess the existing transmission expansion plans of Duke, Progress, SCEG, and SCPSA to ensure that the plans are simultaneously feasible.
- Identify any potential joint solutions that are more efficient or cost-effective than individual company plans, which also improve the simultaneous feasibility of the Participant companies' transmission expansion plans.
- The Power Flow Study Group ("PFSG") will perform the technical analysis outlined in this study scope under the guidance and direction of the Planning Committee ("PC").

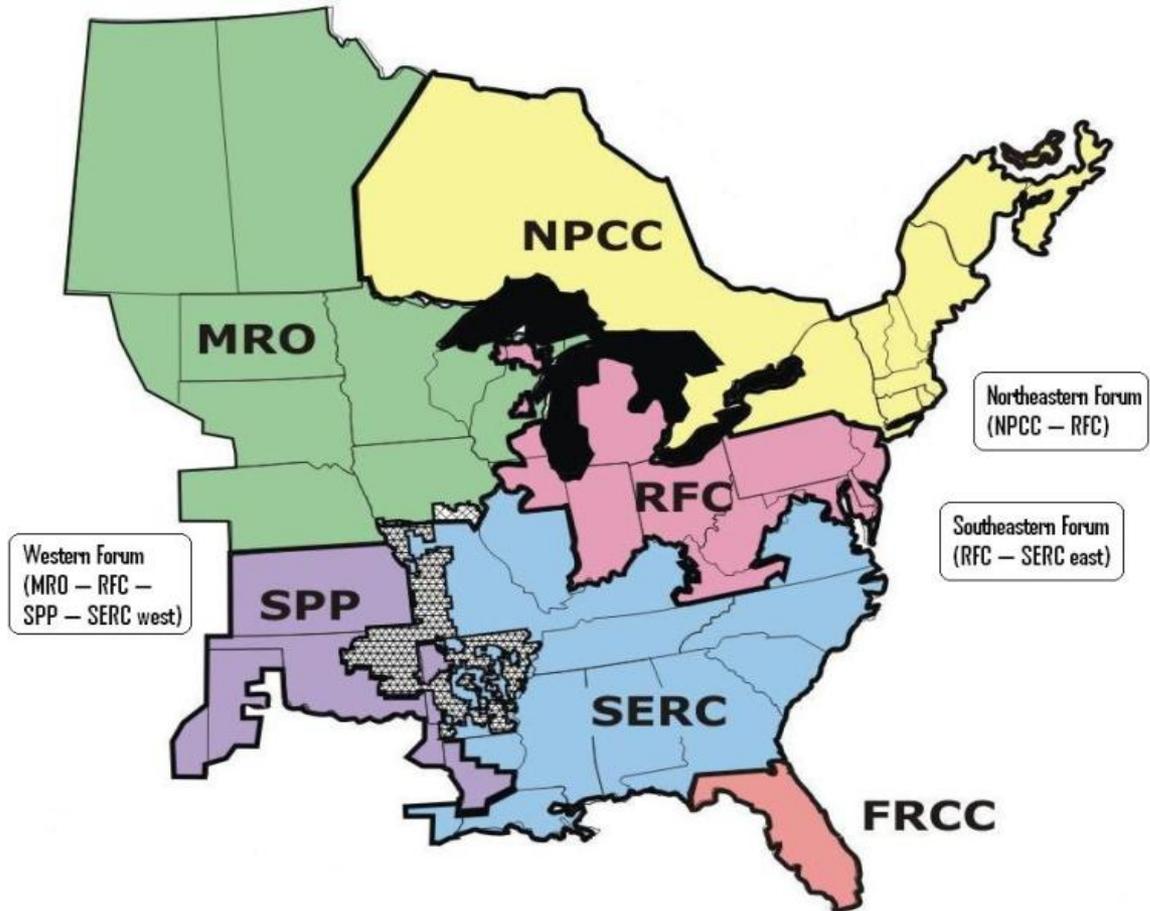
CTCA Studies 2013 Schedule

- No active work is ongoing
- Planning Committee will review powerflow study work assignment at next conference call (July 2013).

CTCA Studies

Questions?

ERAG Assessments



SERC East-RFC-NPCC

- **SERC East**
 - ✓ VACAR (Duke, DVP, DEP, SCE&G, SCPSA)
 - ✓ Central (TVA, EON U.S., EKPC, BRECO)
- **Reliability First Corporation**
 - ✓ PJM (Pennsylvania, New Jersey, Maryland)
 - ✓ MISO (Midwest Independent System Operator)

SERC East-RFC-NPCC

(CONT.)

- Northeast Power Coordinating Council
 - ✓ Northeast United States
 - ✓ Southeast Canada

SERC East-RFC-NPCC Studies

- Seasonal and Near Term/Long Term Studies are to be prepared on a 4-year rotation.
- Rotation will consist of two assessments being performed each year.

SERC East-RFC-NPCC Studies

- Year A Summer Year A Winter/ Year A/Year B
- 2012 2012 Summer 2012/13 Winter
- Year B Summer Year B Summer - Near Term
- 2013 2013 Summer Near Term
- Year C Summer Year C Winter Year C/Year D
- Year D Summer Year D Summer - Long Term

SERC East-RFC-NPCC

2013 Summer Transmission System Assessment Scope

- Develop 2013 summer base case with all scheduled firm capacity backed transactions
- Determine thermal regional and sub-regional FCITCs
- Determine FCTTCs for regional and sub-regional transfers
- Study work completed Jan-April 2013
- Final Report issued May 2103.

SERC East-RFC-NPCC

2013 Summer Preliminary Results

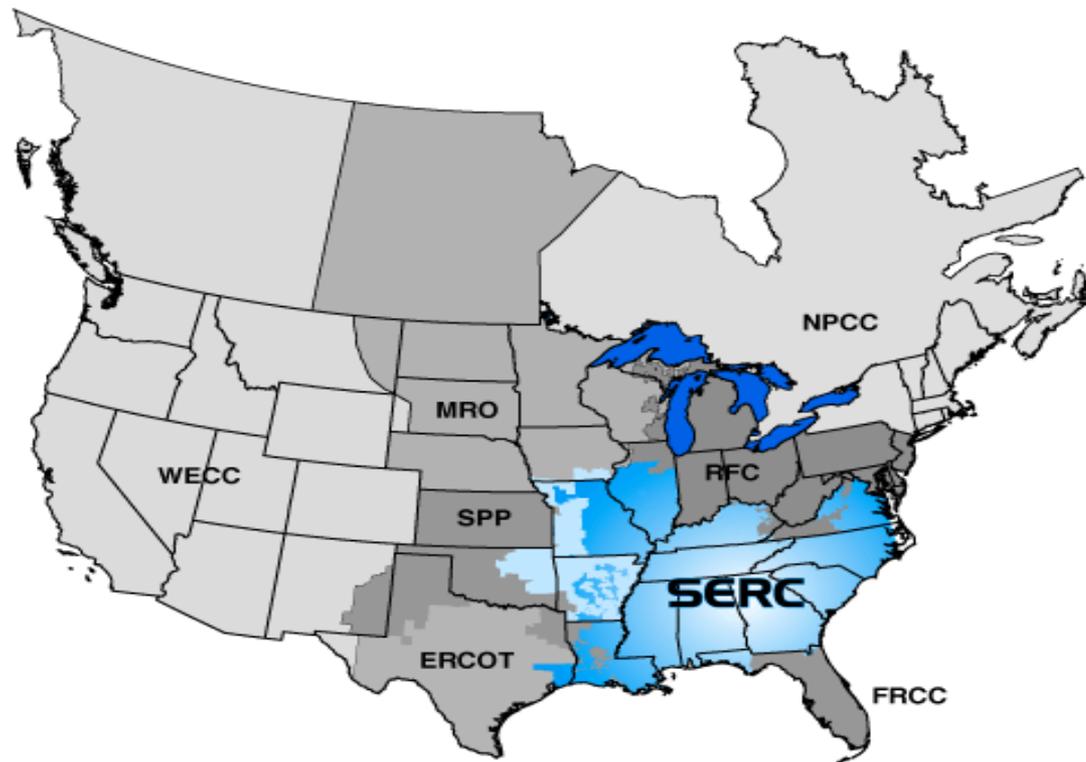
- No SCE&G facilities were identified to limit transfers in the 2013 Summer Assessment
- No Santee Cooper facilities were identified to limit transfers in the 2013 Summer Assessment.

ERAG Reliability Assessments

Questions?

SERC LTSG Assessments

SERC Future Year Assessments Long Term Study Group (LTSG)



SERC LTSG Study

Purpose

- Analyze the performance of the members' transmission systems and identify limits to power transfers occurring non-simultaneously among the SERC members.
- Evaluate the performance of bulk power supply facilities under both normal and contingency conditions for future years.
- Focus on the evaluation of sub-regional and company-to-company transfer capability.

SERC Long Term Study Group

2013 Work Schedule

- LTSG Data Bank Update –May 21-24 Hosted by Entergy
- Study assignment by RSSC in July 2013
- Work completed by LTSG August thru October
- Report issued late November 2013.

SERC LTSG Study

Scope

- Assess the strength of the SERC interconnected network by determining its ability to support power transfers.
- Meet NERC Reliability Standards and SERC Requirements.
- Base case is developed by the SERC LTSG Modeling Group.

SERC LTSG Assessments

Questions?

Two Party and Multi-Party Assessments

Two Party Studies

- SCE&G and Santee Cooper—Johns Island Area (Charleston SC)
- SCE&G and Santee Cooper—Bluffton Area (Hilton Head SC)
- Southern and Santee Cooper—McIntosh (Savannah River)

Two Party Studies

- SCE&G and SC—Johns Island Area (Charleston SC)
 - Analysis completed in late 2010 and 2011.
 - Initial configuration discussed with SCE&G in 2012
 - SCE&G requested review of different connection point
 - Queensboro
 - Discussions continue between parties

Two Party Studies

- SCE&G and SC—Bluffton Area (Hilton Head SC)
 - Initial configuration discussed with SCE&G.
 - Additional discussions with regard to small project changes.
 - Discussions continue between parties.

Two Party Studies

- Southern and Santee Cooper– McIntosh (Savannah River)
 - Analysis completed in late 2011.
 - Initial configuration discussed with Southern in 2012
 - Discussions continue between parties

Two Party and Multi-Party Assessments

Questions?

Next SCRTP Meeting Activities

Clay Young

Next SCRTP Meeting

- Update on Order 1000 Regional Requirements – FERC Ruling
- Results of TPL Reliability Studies
- Mid August (Subject to change, based on FERC Ruling)
- SCRTP Email Distribution List will be notified
- Register online

South Carolina Regional Transmission Planning

Stakeholder Meeting

Hilton Garden Inn

North Charleston, SC

April 15, 2013